MECH	HANICAL ABBREVIATIONS
(E)	EXISTING ELEMENT TO REMAIN
ACC	AIR COOLED CHILLER
ACU AD	AIR CONDITIONING UNIT ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AFMS	AIR FLOW MEASUREMENT STATION
AHU	AIR HANDLING UNIT
AI AO	ANALOG INPUT ANALOG OUTPUT
APD	AIR PRESSURE DROP
APPROX	APPROXIMATELY
ARCH	ARCHITECTURE
BEL BT	BELLMOUTH FITTING BUFFER TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
CC	COOLING COIL
CD CFH	CONDENSATE DRAIN CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CLG CO	COOLING OR CEILING CLEANOUT
COND	CONDENSATE OR CONDENSER
CT	COOLING TOWER
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB DDC	DRY BULB DIRECT DIGITAL CONTROL
DEG	DEGREES
DI	DIGITAL INPUT
DIA	DIAMETER
DN DO	DIGITAL OUTPUT
DOAS	DEDICATED OUTDOOR AIR SYSTEM
DP	DIFFERENTIAL PRESSURE
EA EAT	EXHAUST AIR OR EACH
EF EAT	ENTERING AIR TEMPERATURE EXHAUST FAN
EL OR ELEV.	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
EWT EXH	EXHAUST
F OR °F	DEGREES FARENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA FPM	FULL LOAD AMPS FEET PER MINUTE
FPS	FEET PER SECOND
FS	FLOW SWITCH
FT	FOOT OR FEET
FZ G OR GAL	FREEZESTAT GALLON (U.S.)
GA	GAUGE
GALV	GALVANIZED
GPM GR/LB	GALLON PER MINUTE GRAINS OF MOISTURE PER LB OF DRY AIR
HGI	HOODED GRAVITY INTAKE
HGR	HOODED GRAVITY RELIEF
HP	HORSE POWER
HPR HPS	HEAT PUMP LOOP RETURN HEAT PUMP LOOP SUPPLY
HWB	HOT WATER BOILER
HWCP	HOT WATER CIRCULATION PUMP
HWP	HOT WATER PUMP
HWR HWS	HEATING HOT WATER RETURN HEATING HOT WATER SUPPLY
ID	INSIDE DIAMETER
KW	KILOWATT
L	LOUVER
LAT LB	LEAVING AIR TEMPERATURE POUND
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU'S PER HOUR
NC NO	NOISE CRITERIA OR NORMALLY CLOSED
NO NPSH	NUMBER OR NORMALLY OPEN NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD PD	OUTSIDE DIAMETER PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
QTY	QUANTITY
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RI F	RELIEF AIR
RLF SA	RELIEF AIR SUPPLY AIR
SA SD	SUPPLY AIR SMOKE DAMPER
SA SD SF	SUPPLY AIR SMOKE DAMPER SQUARE FEET
SA SD	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER
SA SD SF SFD	SUPPLY AIR SMOKE DAMPER SQUARE FEET
SA SD SF SFD STD	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD
SA SD SF SFD STD STL TB TSTAT	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT
SA SD SF SFD STD STL TB TSTAT TUC	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER
SA SD SF SFD STD STL TB TSTAT	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT
SA SD SF SFD STD STL TB TSTAT TUC TYP	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VALVE
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV VOL	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE VOLUME
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VALVE
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV VOL VRF W W/	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE VALVE VOLUME VARIABLE REFREGERANT FLOW WATT WITH
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV VOL VRF W W/ W/O	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE VALVE VOLUME VARIABLE REFREGERANT FLOW WATT WITH WITHOUT
SA SD SF SFD STD STL TB TSTAT TUC TYP UH VAV VFD VLV VOL VRF W W/	SUPPLY AIR SMOKE DAMPER SQUARE FEET COMBINATION FIRE & SMOKE DAMPER STANDARD STEEL TERMINAL BOX THERMOSTAT TERMINAL UNIT CONTROLLER TYPICAL UNIT HEATER VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE VALVE VOLUME VARIABLE REFREGERANT FLOW WATT WITH

WATER PRESSURE DROP

TRANSFER DUCT

XFER

GENERAL LEGEND PHASES EXISTING TO REMAIN DEMOLITION WORK -----**NEW WORK** POINT OF CONNECTION POINT OF DISCONNECT **HVAC LEGEND DUCT SYSTEMS** × \ \ \ **DUCT SYSTEM - SUPPLY AIR DUCT SYSTEM - RETURN AIR DUCT SYSTEM - EXHAUST AIR** AIR TERMINALS CEILING DIFFUSER - SUPPLY AIR CEILING GRILLE - RETURN AIR CEILING GRILLE - EXHAUST AIR AIR TERMINAL TAGS -S=SUPPLY,R=RETURN,E=EXHAUST NUMBER = UNIT DESIGNATION 150 A=6", B=8", C=10" NUMBER = AIRFLOW R-1 -S=SUPPLY,R=RETURN,E=EXHAUST NUMBER = UNIT DESIGNATION SIZE: WIDTH x HEIGHT -NUMBER = AIRFLOW **DUCT ACCESSORIES & FITTINGS** DAMPER, MANUAL BALANCING DAMPER, MOTORIZED CONTROL DAMPER, SMOKE DAMPER, COMBINATION FIRE & SMOKE DAMPER, BACKDRAFT DUCT ELBOW, RECTANGULAR, MITERED WITH TURNING VANES DUCT ELBOW, ROUND / RECTANGULAR, RADIUS BEND. DUCT ELBOW, FLAT OVAL, GORED / MITERED BEND. FLEXIBLE DUCT, ROUND / RECTANGULAR

DUCT TRANSITIONS: RECTANGLE

TO RECTANGLE; RECTANGLE TO

ROUND; ROUND TO OVAL.

SENSOR - TEMPERATURE

SENSOR - CARBON MONOXIDE

SENSOR - CARBON DIOXIDE

SENSOR - HUMIDITY

SENSOR - SMOKE

<u>SENSORS</u>

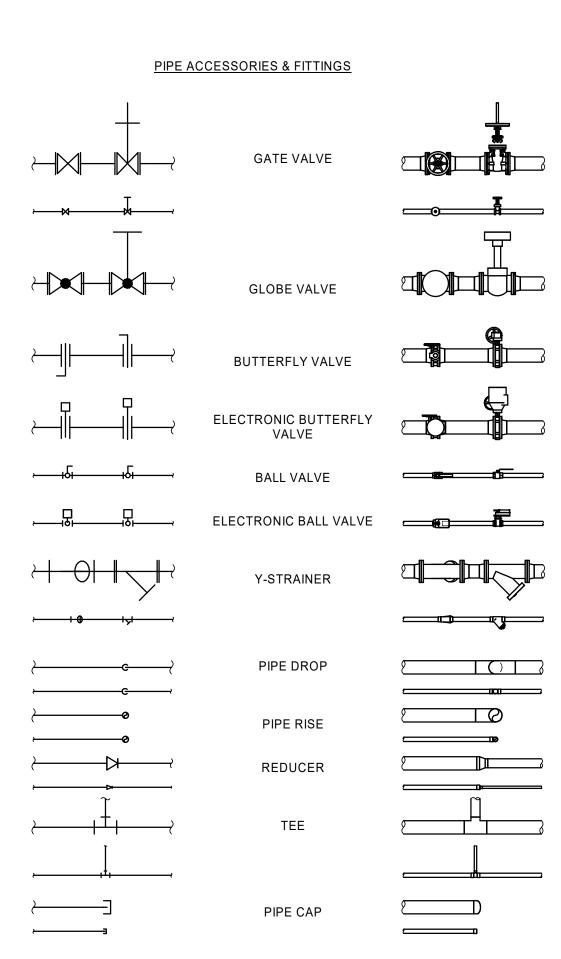
MECHANICAL PIPING LEGEND

10

PIPE SYSTEM - REFRIGERATION, SUCTION

PIPING SYSTEMS

 CD	PIPE SYSTEM - CONDENSATE DRAIN
 CWR	PIPE SYSTEM - CONDENSER WATER RETUR
 CWS	PIPE SYSTEM - CONDENSER WATER SUPPL
 HPR	PIPE SYSTEM - HEAT PUMP LOOP RETURN
 HPS	PIPE SYSTEM - HEAT PUMP LOOP SUPPLY
 ——HWC———	PIPE SYSTEM - HOT WATER RECIRCULATIO
 HWR	PIPE SYSTEM - HOT WATER RETURN
 HWS	PIPE SYSTEM - HOT WATER SUPPLY
 NG	PIPE SYSTEM - NATURAL GAS
 RBP	PIPE SYSTEM - REFRIGERATION, BYPASS
 	PIPE SYSTEM - REFRIGERATION, LIQUID



MECHANICAL GENERAL NOTES

12

- THESE DRAWINGS ARE SCHEMATIC IN NATURE AND INDICATE THE GENERAL AND APPROXIMATE LOCATION OF EQUIPMENT, PIPING AND DUCTWORK. THEY ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM (HVAC) BE PROVIDED WITH ALL NECESSARY EQUIPMENT, APPURTENANCES AND CONTROLS. THE CONTRACTOR SHALL CAREFULLY REVIEW ALL THE CONTRACT DOCUMENTS AND COORDINATE BETWEEN ALL TRADES PRIOR TO SUBMITTING SHOP DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL SIZES, MATERIALS, TEMPERATURE AND PRESSURE RATINGS BEFORE ORDERING OR INSTALLING ANY MATERIALS OR EQUIPMENT. THE CONTRACTOR SHALL PREPARE INSTALLATION INSTRUCTIONS AND FABRICATION DRAWINGS PRIOR TO ACTUAL INSTALLATION.
- REFER TO EACH DRAWING FOR NOTES SPECIFIC TO THAT DRAWING SHEET
- DO NOT SCALE FOR DUCT, PIPE OR EQUIPMENT LOCATIONS.

WORK SAFETY AND QUALITY

13

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF CONTRACTOR'S PERSONNEL EMPLOYED ON THIS PROJECT AND IN PARTICULAR, WHEN WORKING IN CONFINED SPACES. THE CONTRACTOR SHALL COMPLY WITH ALL OCCUPATIONAL SAFETY HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
- ALL MISCELLANEOUS MATERIAL REQUIRED TO ENSURE PROPER INSTALLATION AND IS SHOWN IN DETAILS FOR PIPING, DUCTS, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN A MANNER WHICH MINIMIZES NOISE AND VIBRATION.

COORDINATION WITH OTHER TRADES

- THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF WORK WITH THE WORK OF OTHER TRADES. MINOR DEVIATIONS FROM THE PLANS MAY BE MADE TO AVOID CONFLICTS.
- COORDINATE DUCTWORK AND PIPING WITH ELECTRICAL, STRUCTURE, AND PLUMBING. MAKE OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
- COORDINATE MECHANICAL EQUIPMENT AND MATERIAL LOCATIONS WITH ELECTRICAL, PLUMBING, FIRE PROTECTION, STRUCTURAL AND ARCHITECTURAL PLANS TO AVOID CONFLICTS.
- COORDINATE THE VOLTAGE AND PHASE OF EACH PIECE OF EQUIPMENT WITH DIVISION 26 (ELECTRICAL CONTRACT DOCUMENTS) PRIOR TO ORDERING. PROVIDE WRITTEN VERIFICATION OF COORDINATION WITH DIVISION 26 PRIOR TO INSTALLATION OF EQUIPMENT.
- REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATION OF ALL LOUVERS, VENTS, DUCTS, AND PIPING THAT PENETRATE EXTERIOR WALLS.
- PROVIDE OPENINGS IN BUILDING CONSTRUCTION FOR PASSAGE OF PIPING AND DUCTWORK. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL.
- ALL NECESSARY ALLOWANCES AND PROVISIONS SHALL BE MADE BY THIS CONTRACTOR FOR BEAMS, COLUMNS, TRUSSES OR OTHER OBSTRUCTIONS OF THE BUILDING OR THE WORK OF OTHER CONTRACTORS, WHETHER OR NOT SAME IS INDICATED. WHERE NECESSARY TO AVOID OBSTRUCTIONS, THE DUCTS SHALL BE TRANSFORMED, DIVIDED, OFFSET, RAISED OR LOWERED WITH THE REQUIRED FREE AREA BEING MAINTAINED.

<u>DUCTWORK</u>

- DUCT SIZES ARE SHOWN AS INSIDE CLEAR DIMENSIONS. WHERE INTERNAL INSULATION IS CALLED FOR, DIMENSIONS SHALL BE INCREASED FOR THE THICKNESS OF THE INSULATION. SEE SPECIFICATION FOR THICKNESS.
- ALL BRANCH DUCTWORK SHALL BE SIZED TO MATCH THE TERMINAL CONNECTION SERVED UNLESS NOTED OTHERWISE. FLEXIBLE DUCT TO DIFFUSERS SHALL BE INSTALLED FREE OF KINKS AND SAGS. MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE 6'-0". ALL RUNOUT AND BRANCH DUCTS SHALL CONTAIN A MANUAL VOLUME DAMPER FOR BALANCING.
- ALL DUCT TRANSITIONS FROM SQUARE TO ROUND SHALL BE SMOOTH SQUARE TO ROUND TRANSITIONS.
- ALL DIFFUSERS SHALL HAVE FOUR-WAY BLOW UNLESS NOTED OTHERWISE.
- SEE REFLECTED CEILING PLANS FOR EXACT LOCATION OF AIR DEVICES.
- ALL DAMPERS, DAMPER OPERATORS, AND FANS SHALL BE ACCESSIBLE. LOCATE ALL EQUIPMENT OR APPURTENANCES IN AREAS WITH ACCESSIBLE CEILINGS. THE CONTRACTOR MAY UTILIZE ACCESS PANELS FOR THOSE AREAS NOT EASILY ACCESSIBLE. ALL ACCESS PANEL LOCATIONS SHALL BE COORDINATED WITH THE CONTRACT DOCUMENTS AND APPROVED BY THE OWNER PRIOR TO INSTALLATION OF EQUIPMENT.
- ALL OPEN ENDED DUCTS SHALL BE REINFORCED WITH STEEL ANGLES (1-1/2" X 1-1/2" X 1/8") BOLTED OR RIVETED 6" ON CENTER (MAXIMUM) ALL AROUND THE PERIMETER OF THE DUCT MINIMUM 2 PER SIDE.
- ALL DUCTWORK SHALL BE SLEEVED THROUGH WALL PENETRATIONS.
- PROVIDE AIR TURNING DEVICES IN DUCTWORK AT ANY CHANGES IN DIRECTION OF 30 DEGREES OR GREATER.
- PROVIDE CONICAL TEES FOR ROUND AND FLAT OVAL DUCT TAKE-OFFS.

<u>PIPING</u>

- SLOPE CONDENSATE DRAINS AT 1/8 INCHES FALL PER FOOT MINIMUM IN THE DIRECTION OF FLOW. PROVIDE DRAINAGE TYPE FITTINGS.
- ALL PIPING SHALL BE SLEEVED THROUGH WALL PENETRATIONS.
- SIZE AND ROUTE REFRIGERANT PIPING PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

<u>EQUIPMENT</u>

- INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER SO THAT ALL FILTERS, VALVES, MOTORS, DAMPERS, ETC., ARE COMPLETELY ACCESSIBLE AND SERVICEABLE, INCLUDING ACCESS DOORS IF REQUIRED.
- COMPLETE AND PROPER INSTALLATION OF THERMOSTATS AND ALL OTHER NECESSARY FIELD MOUNTED CONTROL COMPONENTS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THE EQUIPMENT MANUFACTURERS SHALL FURNISH COMPLETE WIRING CONTROLS. ALL CONTROL WIRING SHALL BE IN CONDUIT AND INSTALLED PER DIVISION 26 OF THE SPECIFICATIONS.
- PROVIDE FLEXIBLE CONNECTIONS BETWEEN HVAC EQUIPMENT AND SHEET METAL DUCTWORK.

CONTROLS

PROVIDE THERMOSTATS OR HUMIDISTATS WHERE SHOWN ON THE DRAWINGS.

RENOVATION WORK

THIS PROJECT IS A RENOVATION OF AN EXISTING FACILITY, AND PREVIOUS RECORD DRAWINGS FORM THE BASIS FOR MANY OF THESE DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OR PURCHASE OF EQUIPMENT, MATERIALS, AND ASSEMBLIES. THERE MAY EXIST FIELD CONDITIONS WHICH DIFFER FROM THOSE SHOWN ON THESE DRAWINGS. ANY SUCH DEVIATIONS SHALL BE BROUGHT TO THE ATTENTION OF OWNER FOR RESOLUTION BEFORE PROCEEDING WITH ANY CONSTRUCTION, FABRICATION, OR MATERIAL/EQUIPMENT PURCHASE WHICH WOULD BE UNUSABLE UNDER THOSE CIRCUMSTANCES.

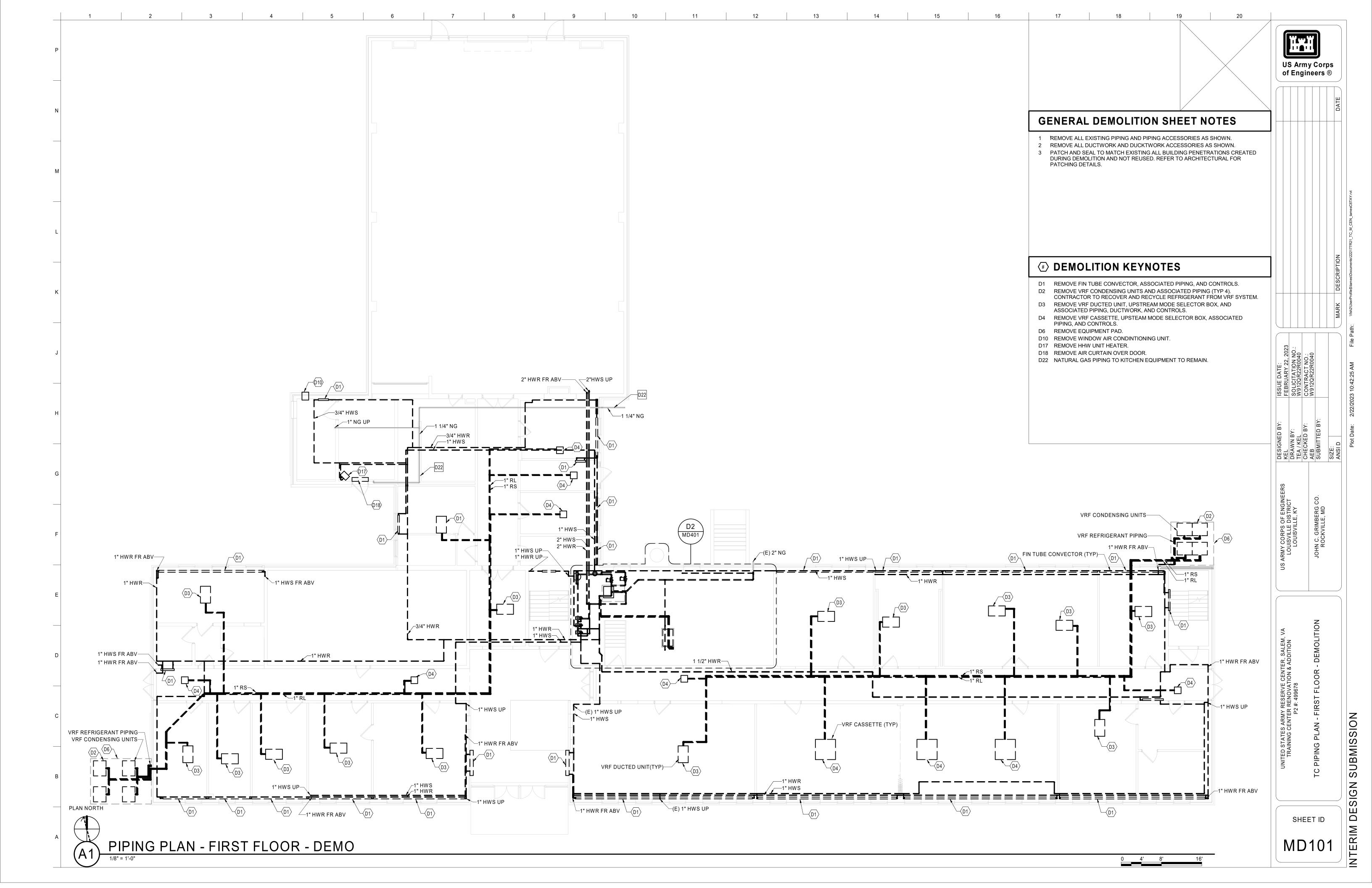


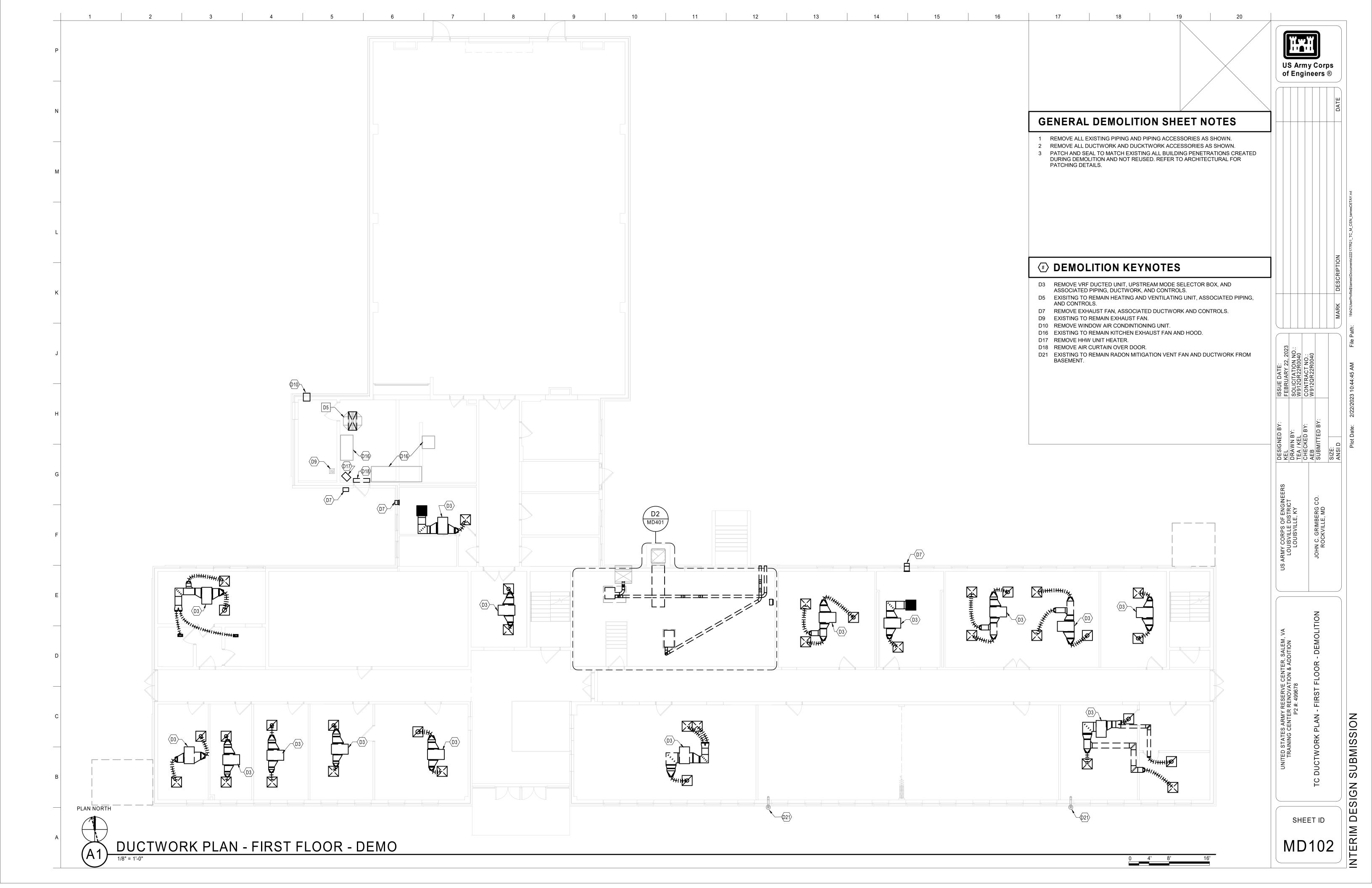
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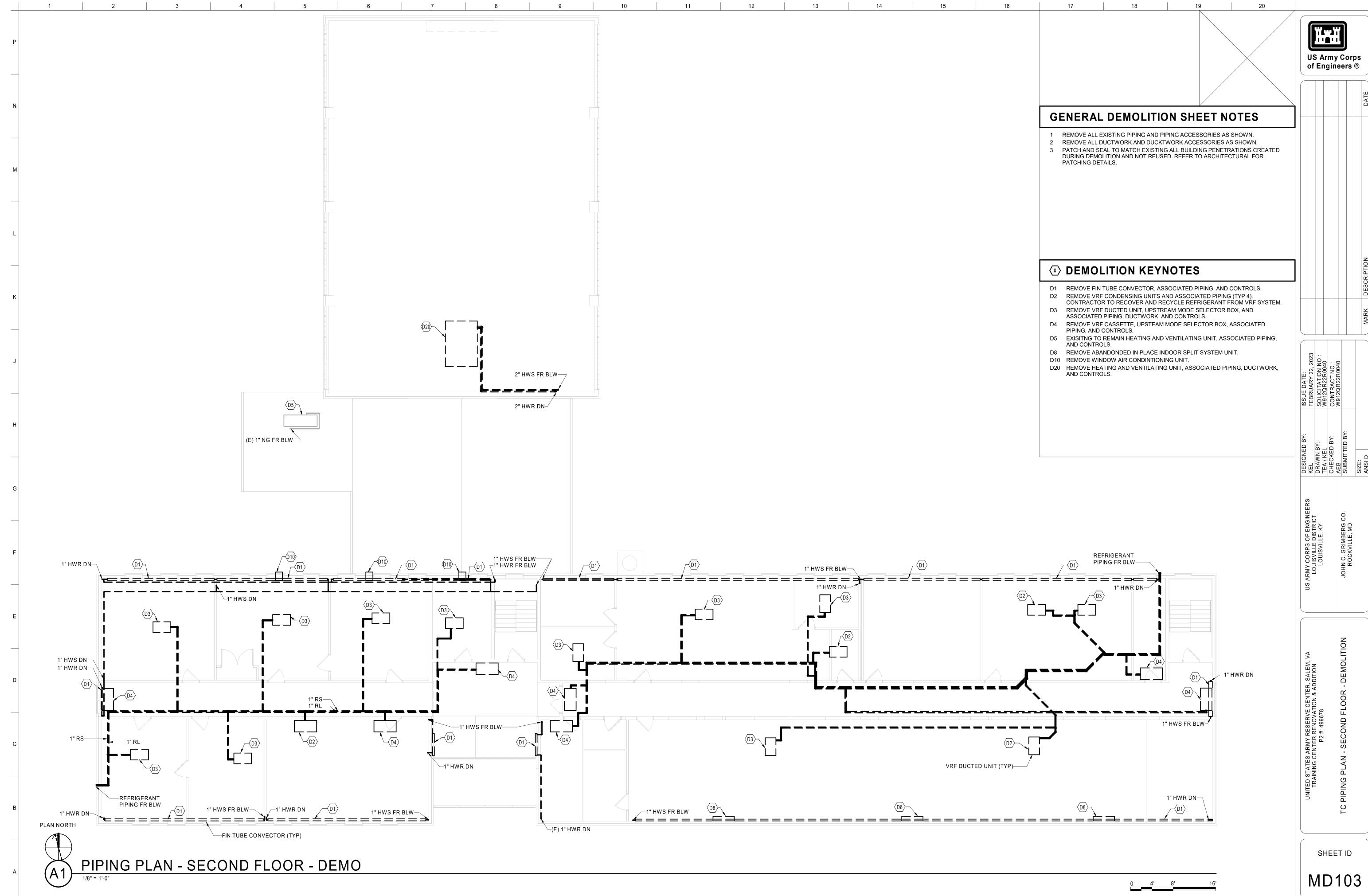
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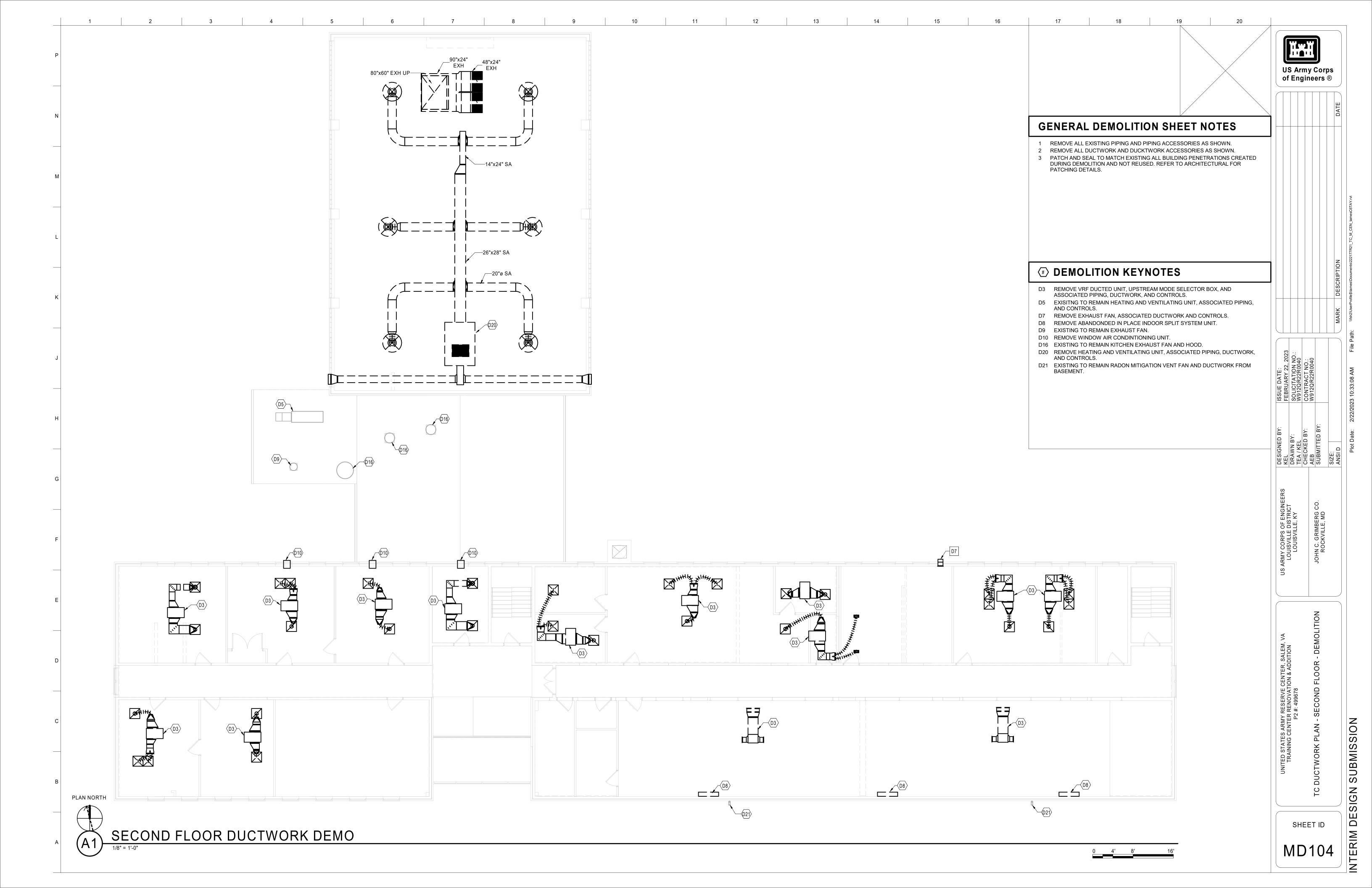
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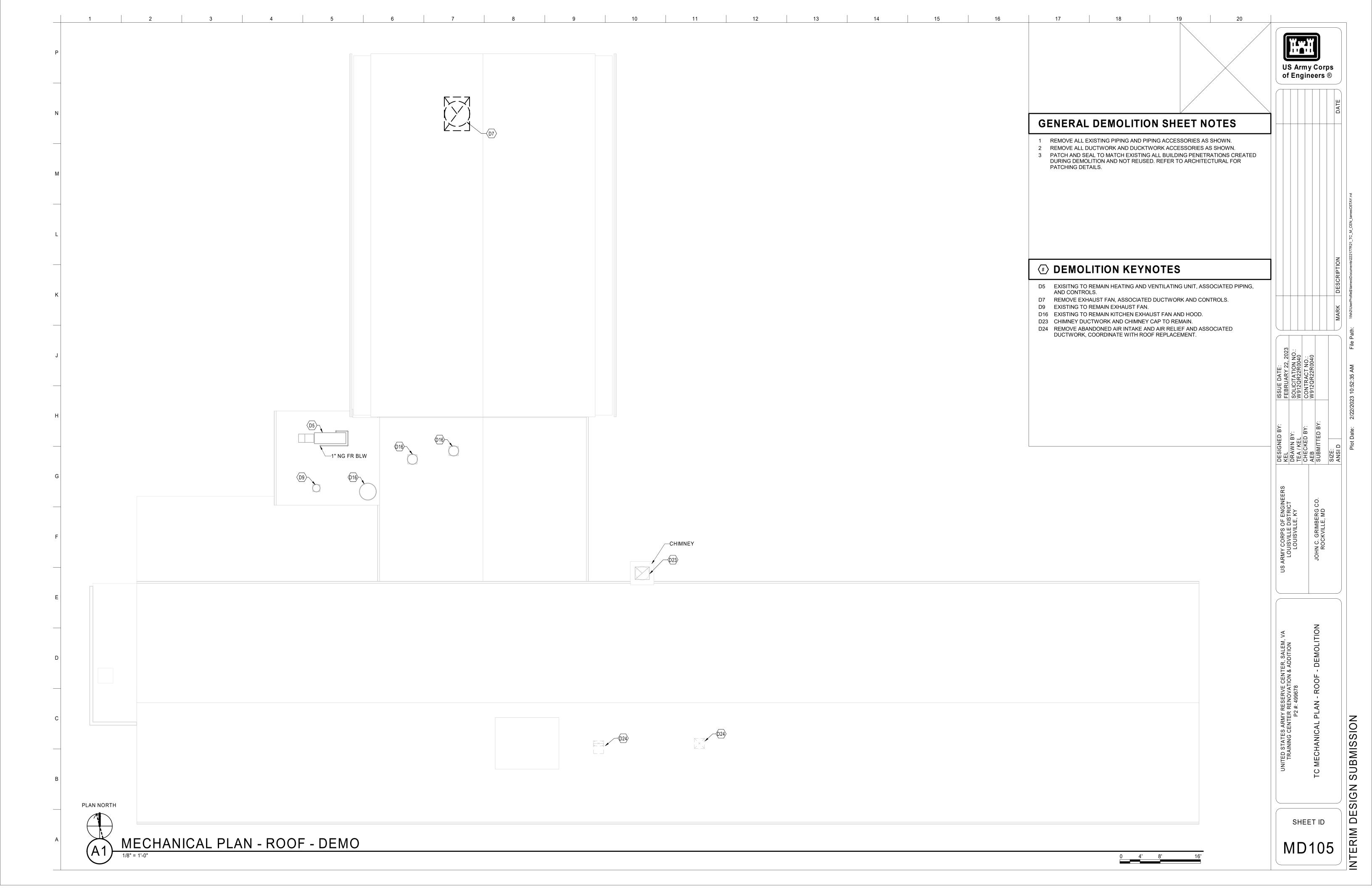
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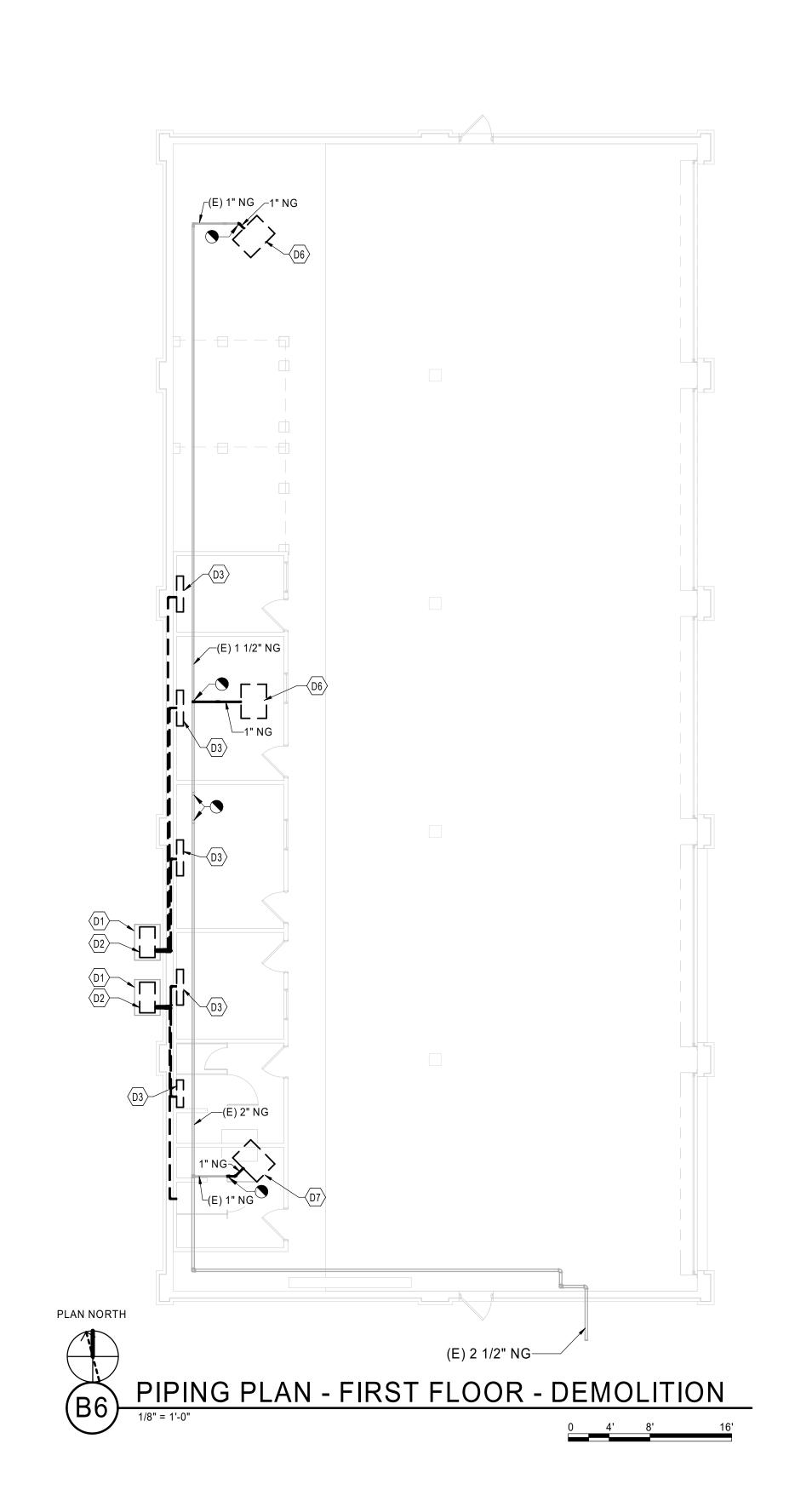














GENERAL DEMOLITION SHEET NOTES

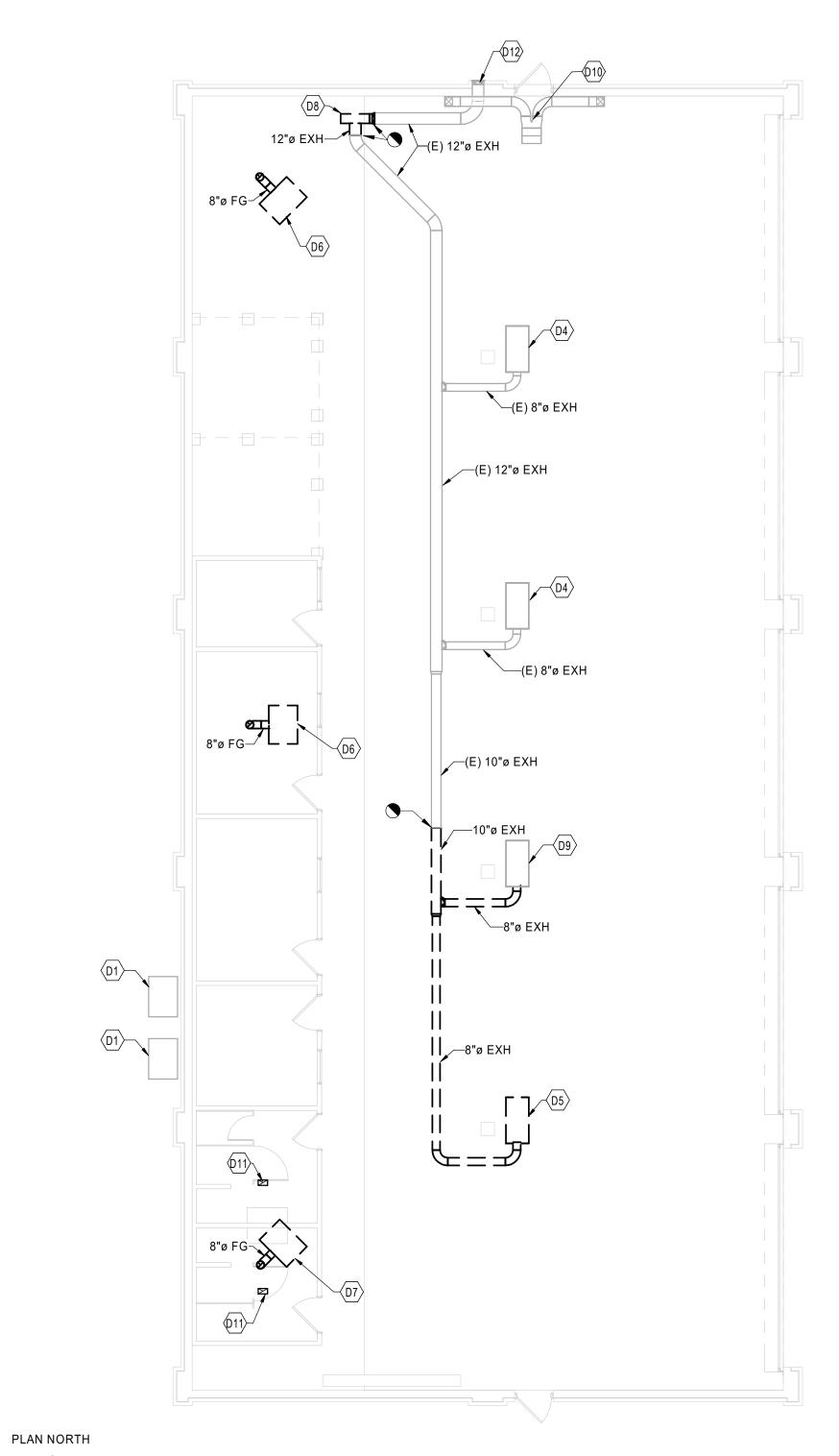
- 1 REMOVE ALL EXISTING PIPING AND PIPING ACCESSORIES AS SHOWN.
- 2 REMOVE ALL DUCTWORK AND DUCKTWORK ACCESSORIES AS SHOWN.
- PATCH AND SEAL TO MATCH EXISTING ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT REUSED. REFER TO ARCHITECTURAL FOR PATCHING DETAILS.

DEMOLITION KEYNOTES

D1 REMOVE PLASTIC EQUIPMENT PAD.

17

- D2 REMOVE SPLIT SYSTEM OUTDOOR CONSENSING UNIT AND ASSOCIATED
- D3 REMOVE SPLIT SYSTEM INDOOR EVAPORATOR UNIT AND ASSOCIATED PIPING.
- D6 RELOCATE GAS-FIRED UNIT HEATER.
- D7 REMOVE GAS-FIRED UNIT HEATER.





GENERAL DEMOLITION SHEET NOTES

- 1 REMOVE ALL EXISTING PIPING AND PIPING ACCESSORIES AS SHOWN.
- 2 REMOVE ALL DUCTWORK AND DUCKTWORK ACCESSORIES AS SHOWN.
- 3 PATCH AND SEAL TO MATCH EXISTING ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT REUSED. REFER TO ARCHITECTURAL FOR PATCHING DETAILS.

DEMOLITION KEYNOTES

D1 REMOVE PLASTIC EQUIPMENT PAD.

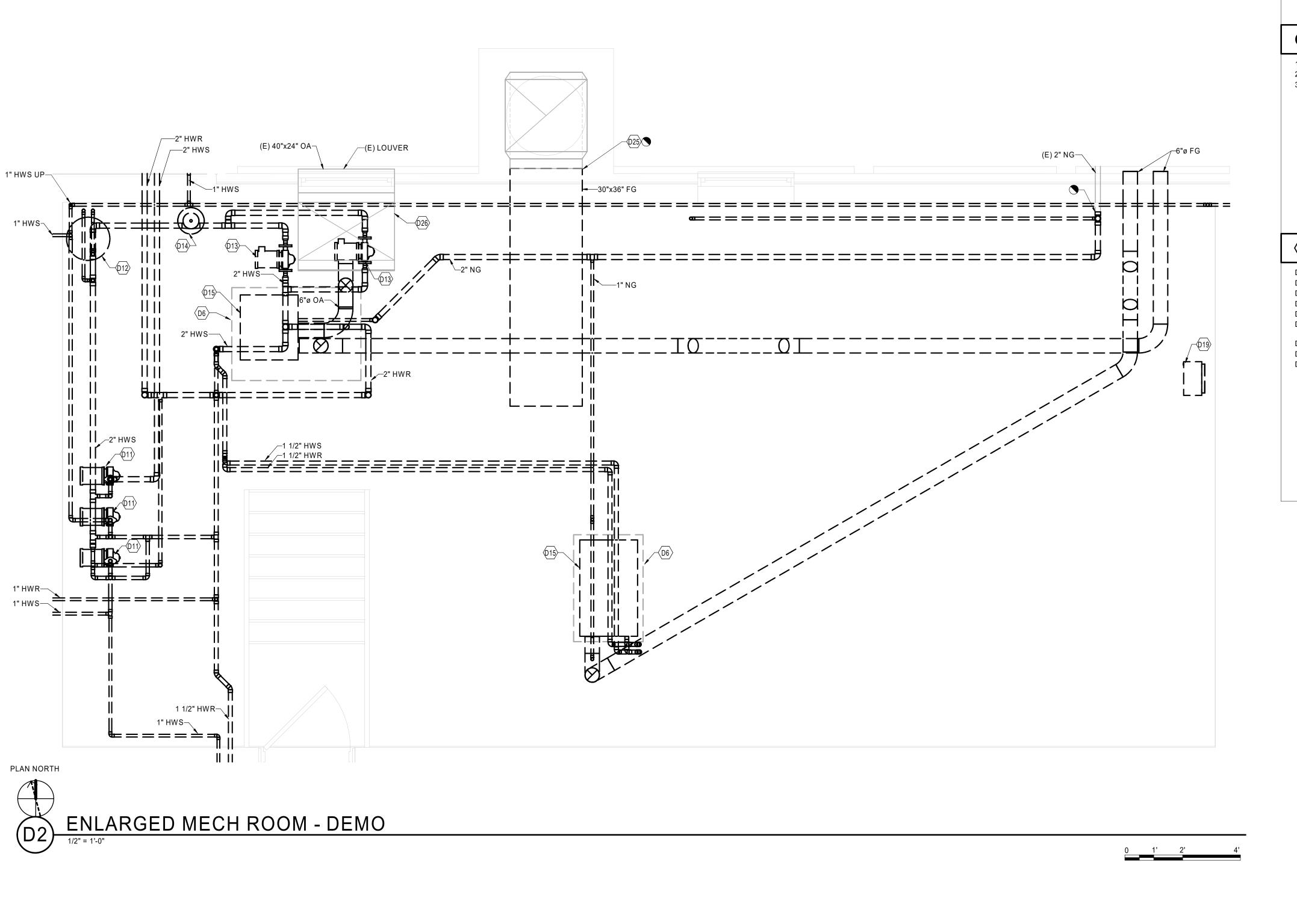
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- D4 EXISTING TO REMAIN VEHICLE EXHAUST HOSE REEL.
- D5 REMOVE VEHICLE EXHAUST HOSE REEL AND ACOSSIATED DUCTWORK.
- D6 RELOCATE GAS-FIRED UNIT HEATER.
- D7 REMOVE GAS-FIRED UNIT HEATER. D8 REMOVE EXHAUST FAN.
- D9 RELOCATE VEHICLE EXHAUST HOSE REEL.
- D10 EXISTING TO REMAIN ABANDONED DUCTWORK.
- D11 REMOVE BATHROOM EXHAUST GRILLE. D12 EXISTING TO REMAIN EXHAUST LOUVER.

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DUCTWORK PLAN - FIRST FLOOR - DEMOLITION



GENERAL DEMOLITION SHEET NOTES

1 REMOVE ALL EXISTING PIPING AND PIPING ACCESSORIES AS SHOWN.

2 REMOVE ALL DUCTWORK AND DUCKTWORK ACCESSORIES AS SHOWN. PATCH AND SEAL TO MATCH EXISTING ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT REUSED. REFER TO ARCHITECTURAL FOR PATCHING DETAILS.

DEMOLITION KEYNOTES

D6 REMOVE EQUIPMENT PAD.

D11 REMOVE INLINE HHW PUMP, ASSOCIATED PIPING, AND CONTROLS.

D12 REMOVE CHEMICAL SHOT FEEDER.

D13 REMOVE BOILER CIRCULATION PUMP, ASSOCIATED PIPING, AND CONTROLS. D14 REMOVE AIR SEPARATOR.

D15 REMOVE CONENSING BOILER, ASSOCIATED PIPING, VENT DUCT, AND CONTROLS.

D19 REMOVE ELECTRIC UNIT HEATER.

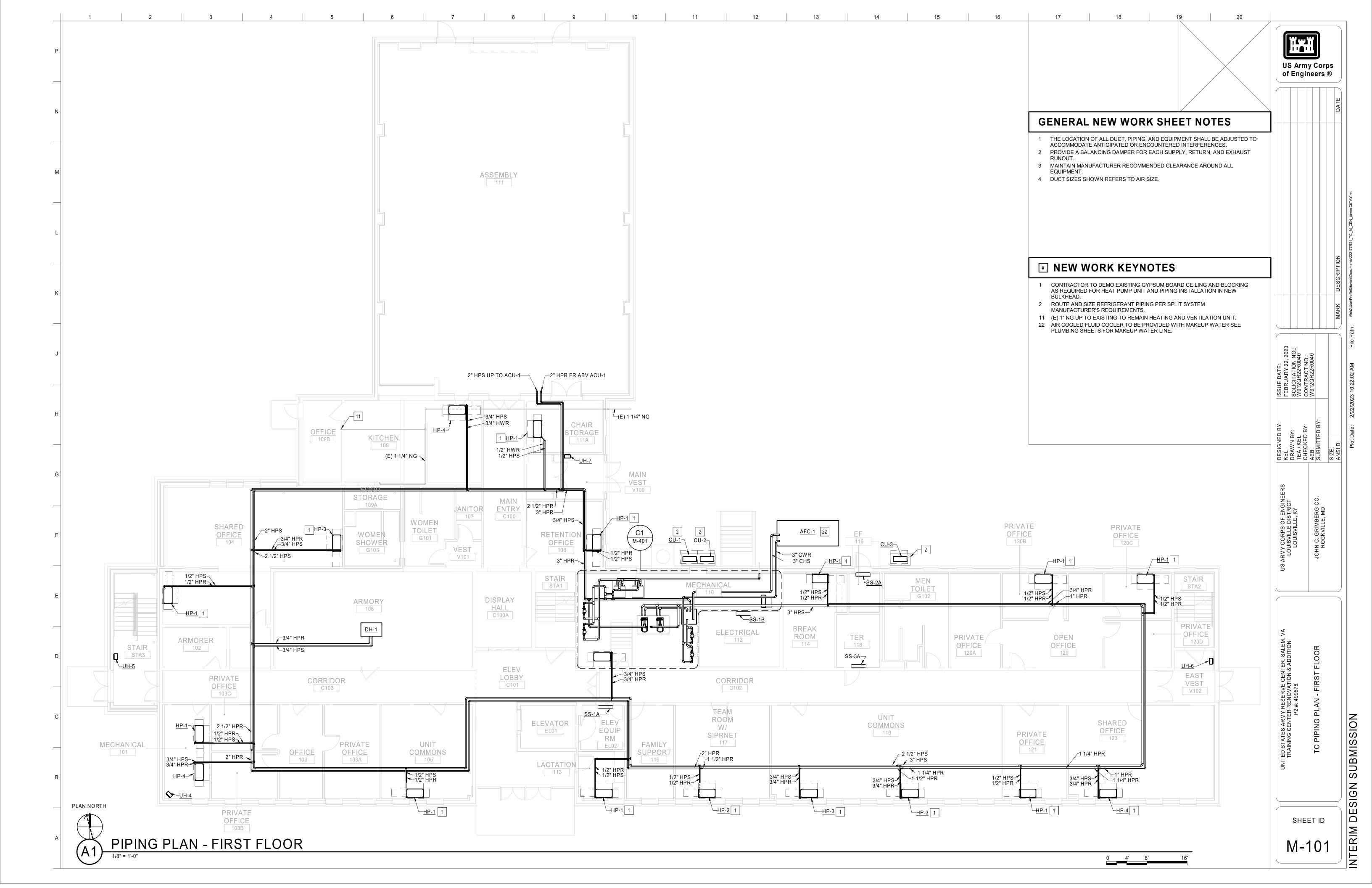
D25 DEMOLISH CHIMNEY DUCTWORK BACK TO WALL AND CAP.

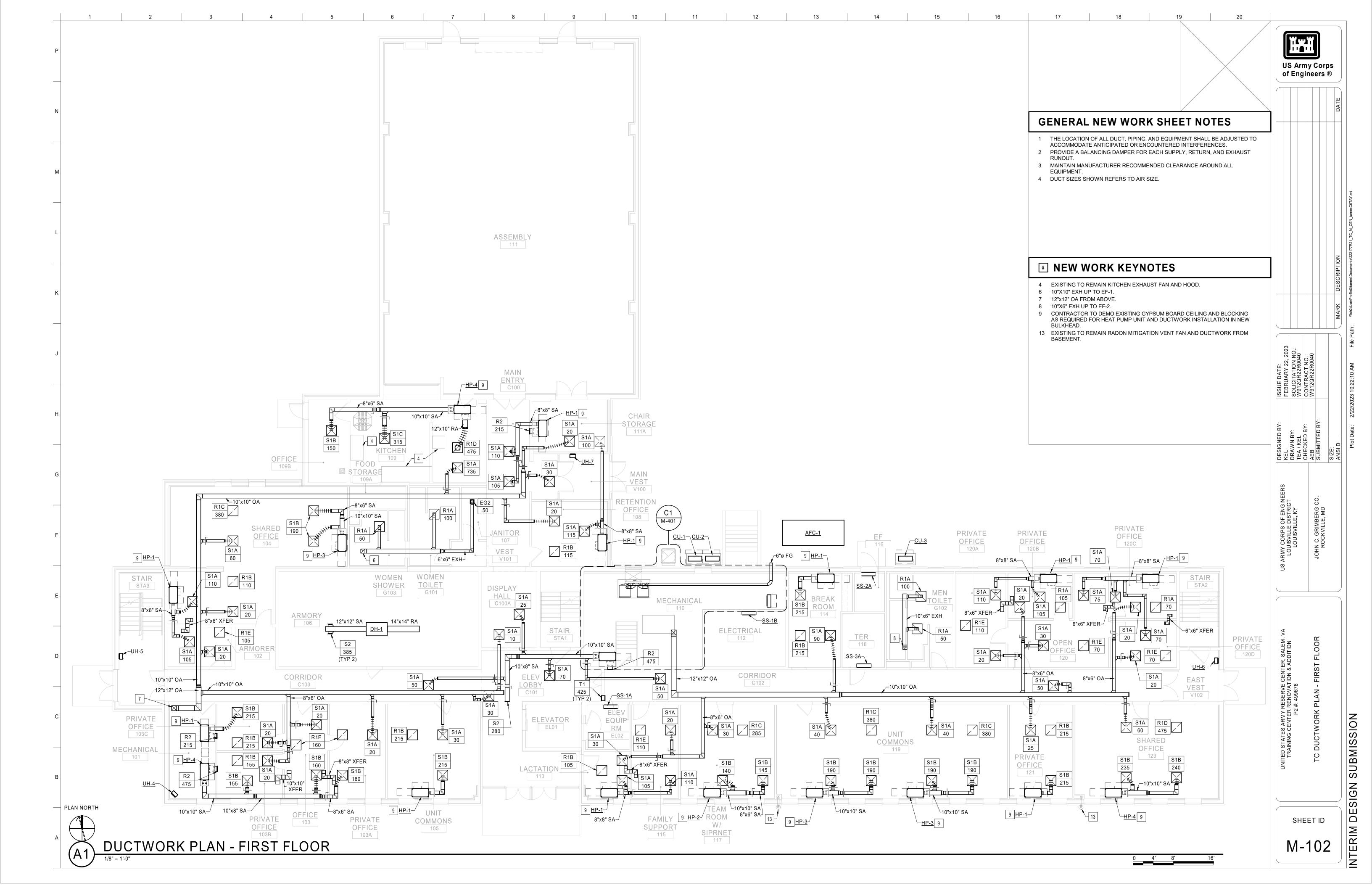
D26 OUTSIDE AIR LOUVER AND DUCTWORK TO REMAIN.

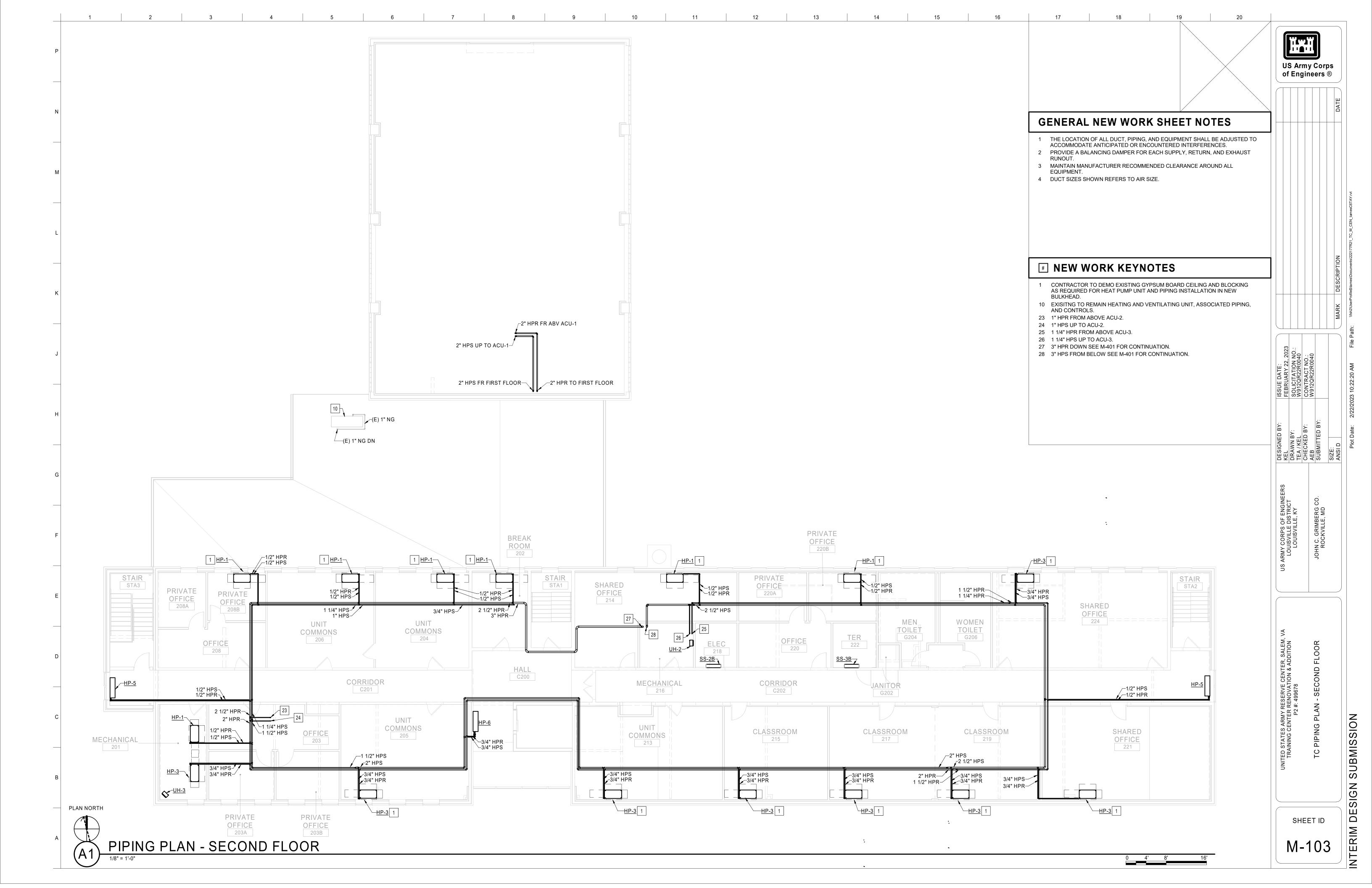
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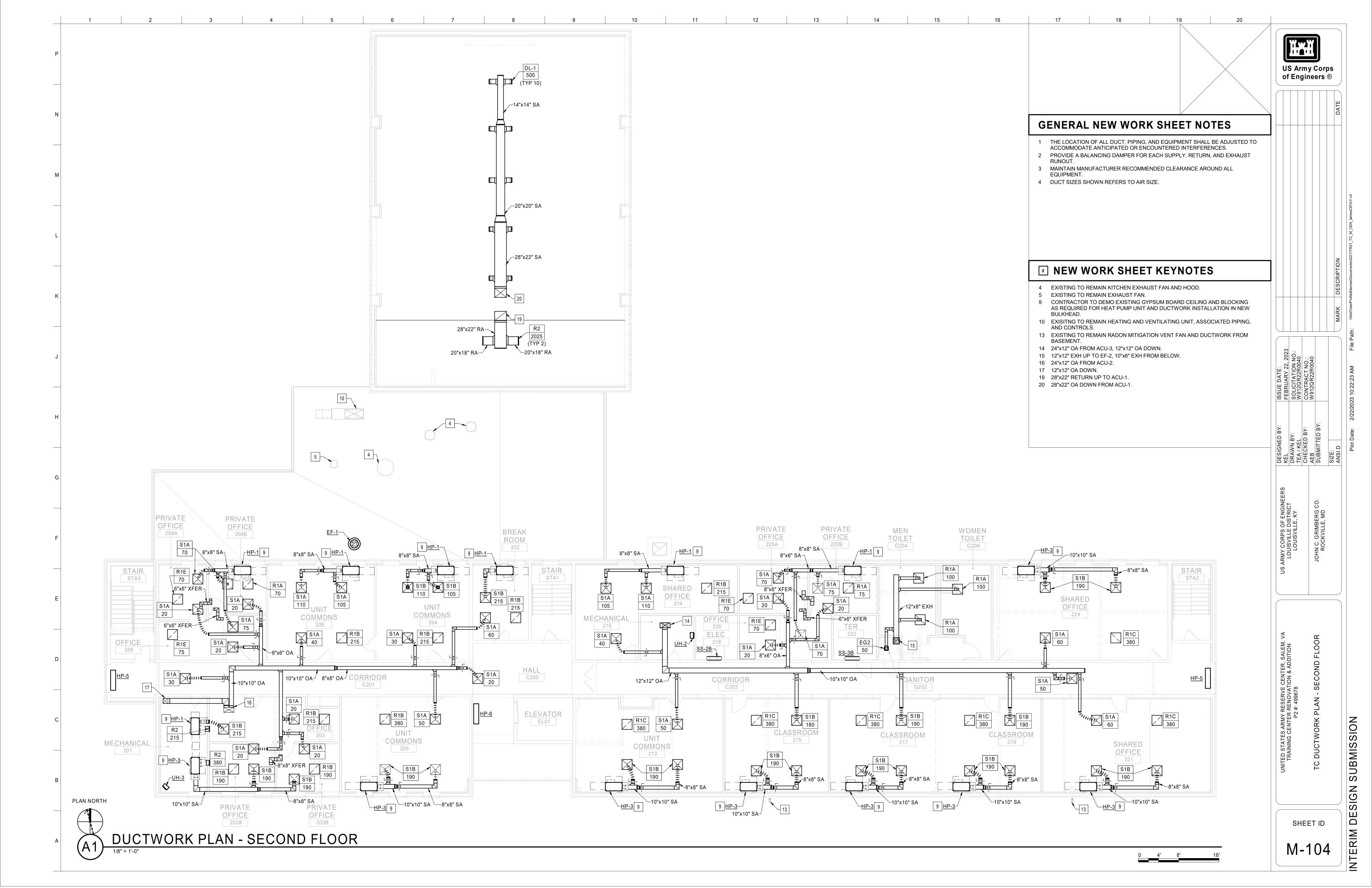
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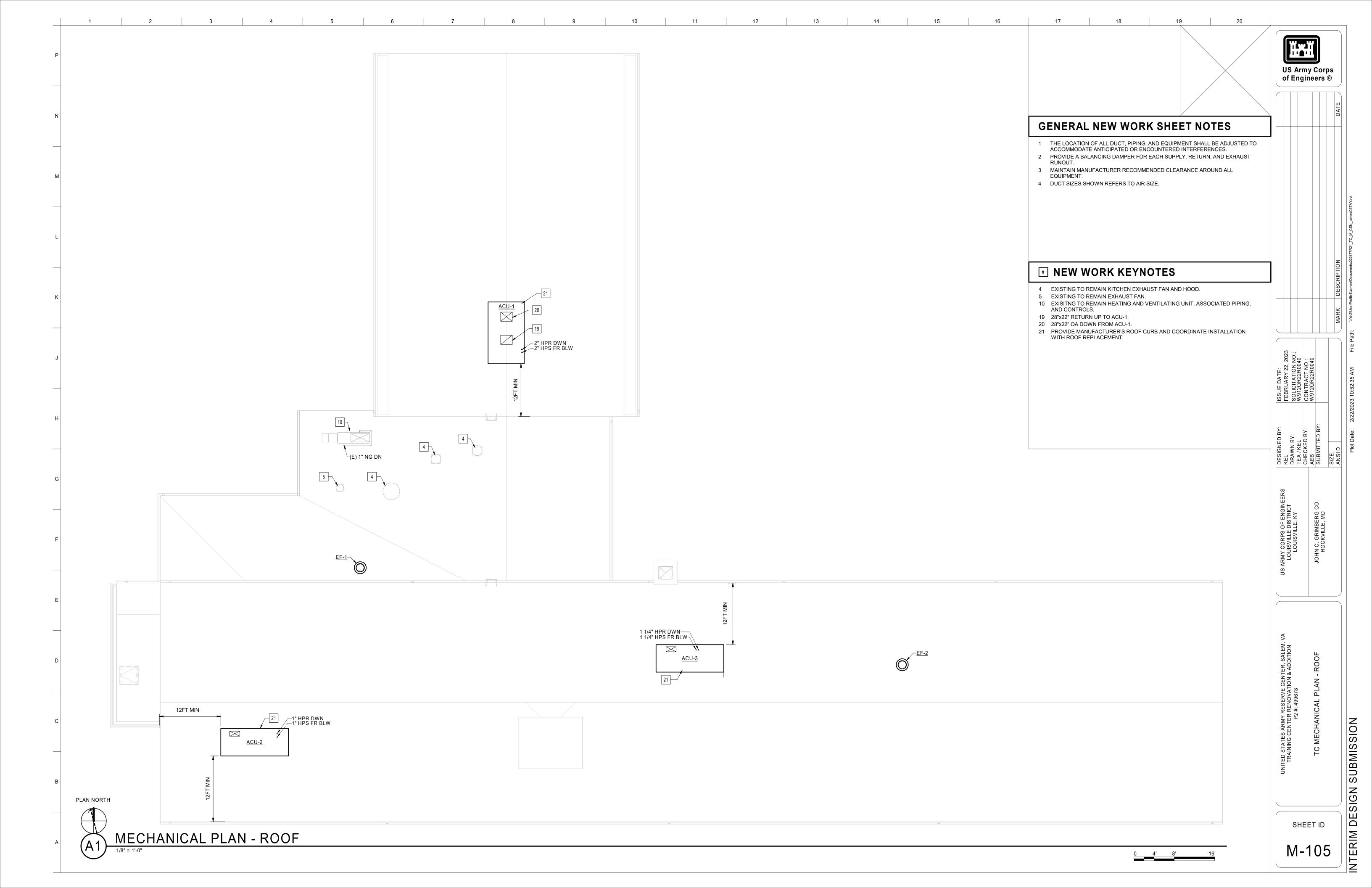
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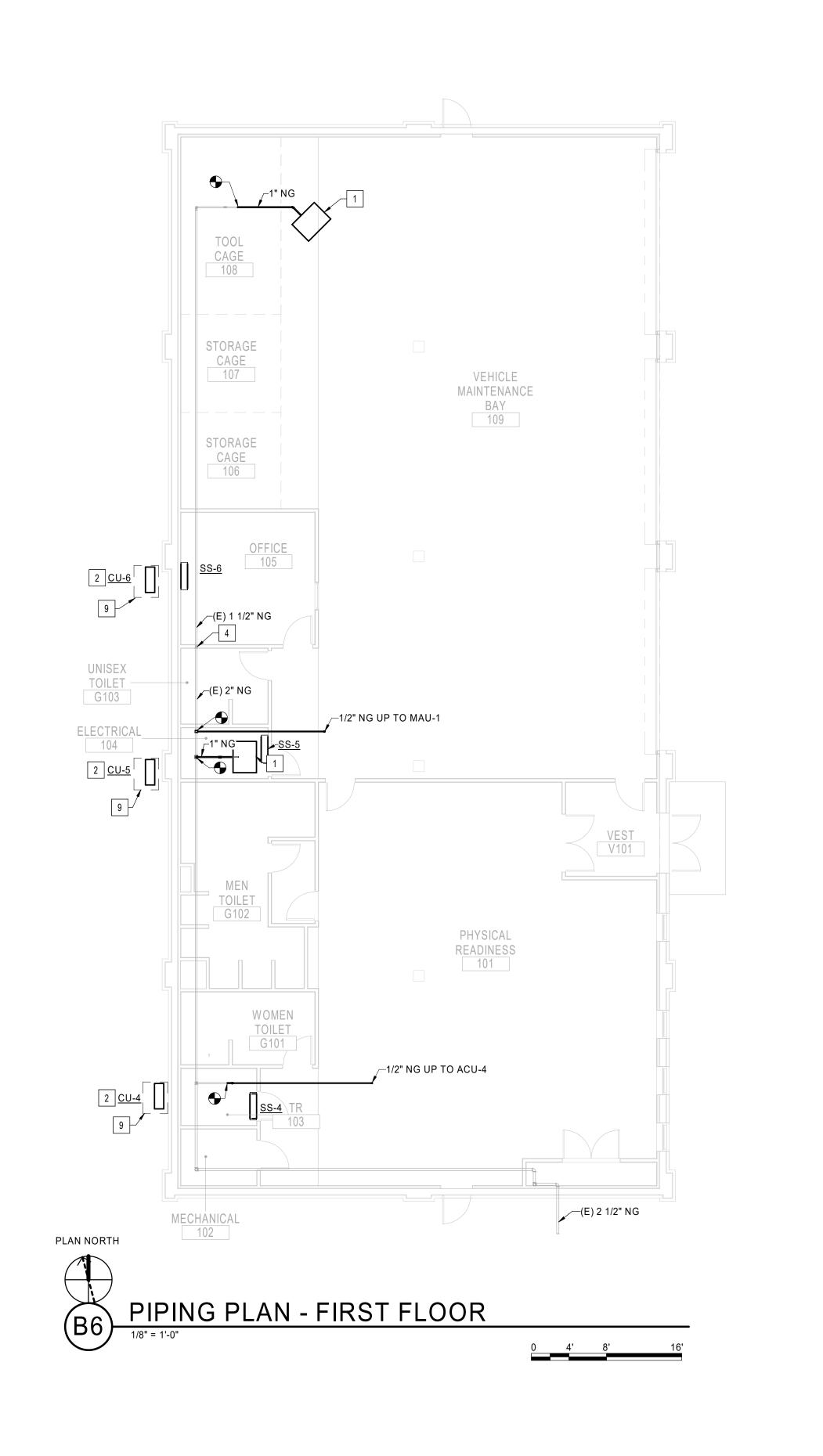














- 1 THE LOCATION OF ALL DUCT, PIPING, AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES.
- 2 PROVIDE A BALANCING DAMPER FOR EACH SUPPLY, RETURN, AND EXHAUST
- 3 MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
- 4 DUCT SIZES SHOWN REFERS TO AIR SIZE.

NEW WORK KEYNOTES

- 1 RELOCATED GAS-FIRED UNIT HEATER.
- 2 ROUTE AND SIZE REFRIGERANT PIPING PER SPLIT SYSTEM MANUFACTURER'S REQUIREMENTS.
- 4 CAP PIPING.

17

9 PROVIDE EQUIPMENT PAD.

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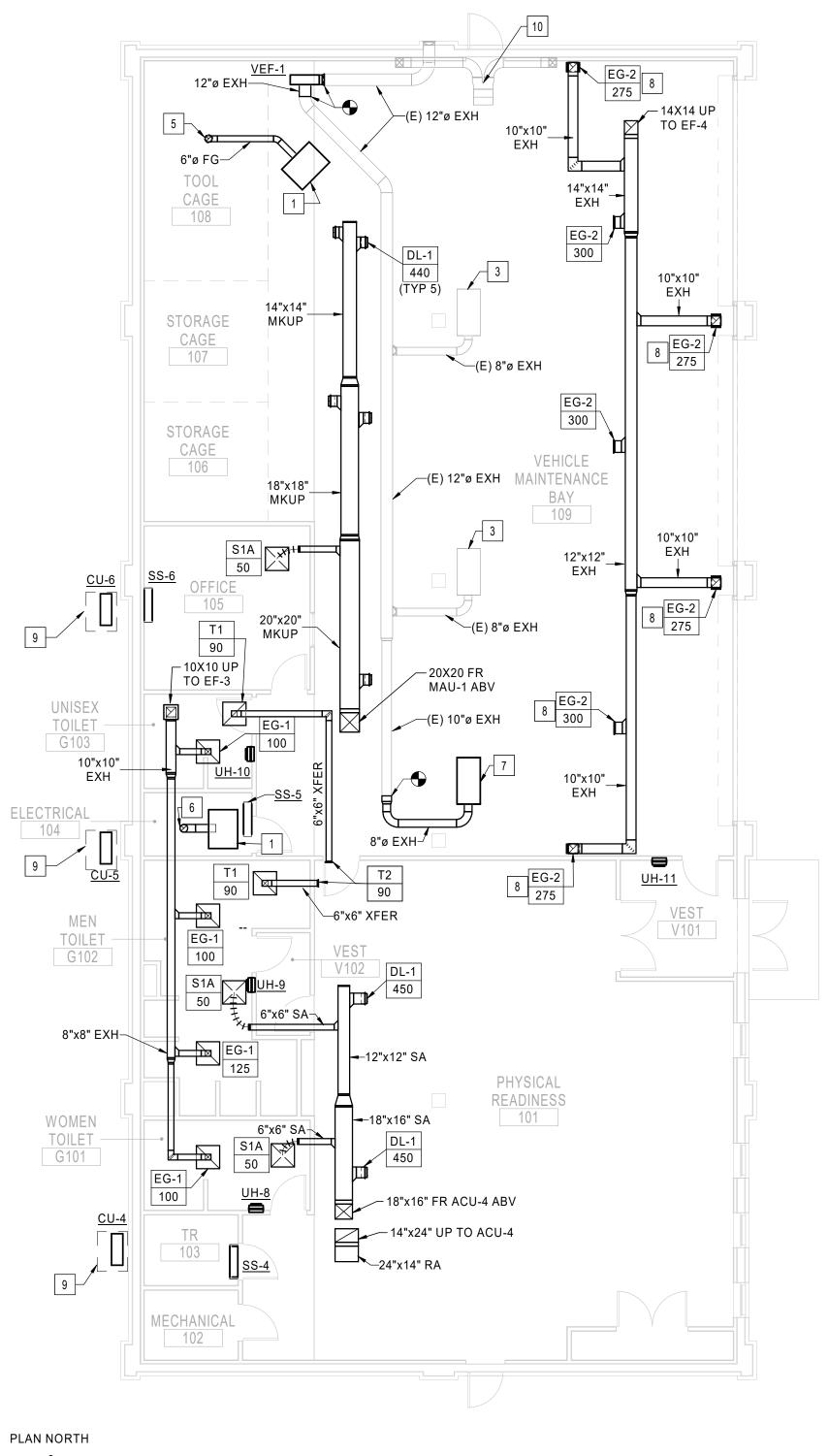
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P2 #: 499678

VMS PIPING PLAN - FIRST FLOOR

SHEET ID

INTERIM DESIGN SUBMISSION







GENERAL NEW WORK SHEET NOTES

- THE LOCATION OF ALL DUCT, PIPING, AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES.
- 2 PROVIDE A BALANCING DAMPER FOR EACH SUPPLY, RETURN, AND EXHAUST
- 3 MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
- 4 DUCT SIZES SHOWN REFERS TO AIR SIZE.

17

NEW WORK KEYNOTES

- 1 RELOCATED GAS-FIRED UNIT HEATER.
- EXISTING TO REMAIN VEHICLE EXHAUST HOSE REEL.
 REUSE EXISTING FLUE GAS VENT THROUGH ROOF.
- 6 PROVIDE FLUE GAS VENT THROUGH ROOF.
- 7 RELOCATED VEHICLE EXHAUST HOSE REEL.8 LOCATE EXHAUST GRILLE 1FT AFF.
- 9 PROVIDE EQUIPMENT PAD.
- 10 EXISTING TO REMAIN ABANDONED DUCTWORK.

ESIGNED BY: ISSUE DATE:

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RAWN BY: SOLICITATION NO.:
EL / TEA

HECKED BY: W912QR22R0040

SEL / TEA

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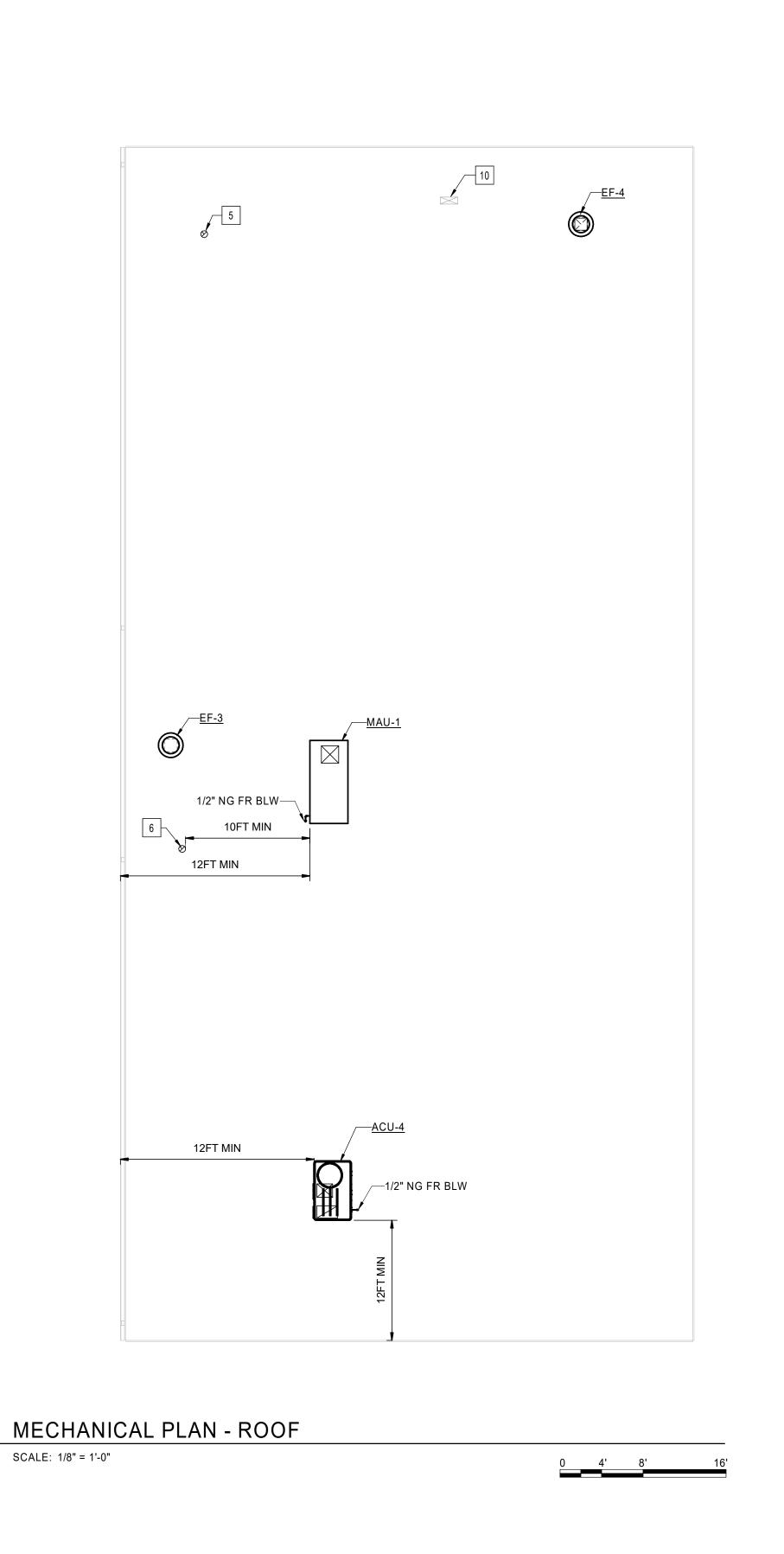
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US ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
LOUISVILLE, KY
JOHN C. GRIMBERG CO.
ROCKVILLE, MD

G CENTER RENOVATION & ADDITION
P2 #: 499678
CTWORK PLAN - FIRST FLOOR

UNITED STATES ARMY RESERVE CE
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SHEET ID



PLAN NORTH



- 1 THE LOCATION OF ALL DUCT, PIPING, AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES.
- 2 PROVIDE A BALANCING DAMPER FOR EACH SUPPLY, RETURN, AND EXHAUST RUNOUT.
- 3 MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
- 4 DUCT SIZES SHOWN REFERS TO AIR SIZE.

NEW WORK KEYNOTES

- 5 REUSE EXISTING FLUE GAS VENT THROUGH ROOF.
- 6 PROVIDE FLUE GAS VENT THROUGH ROOF.

10 EXISTING TO REMAIN ABANDONED DUCTWORK.

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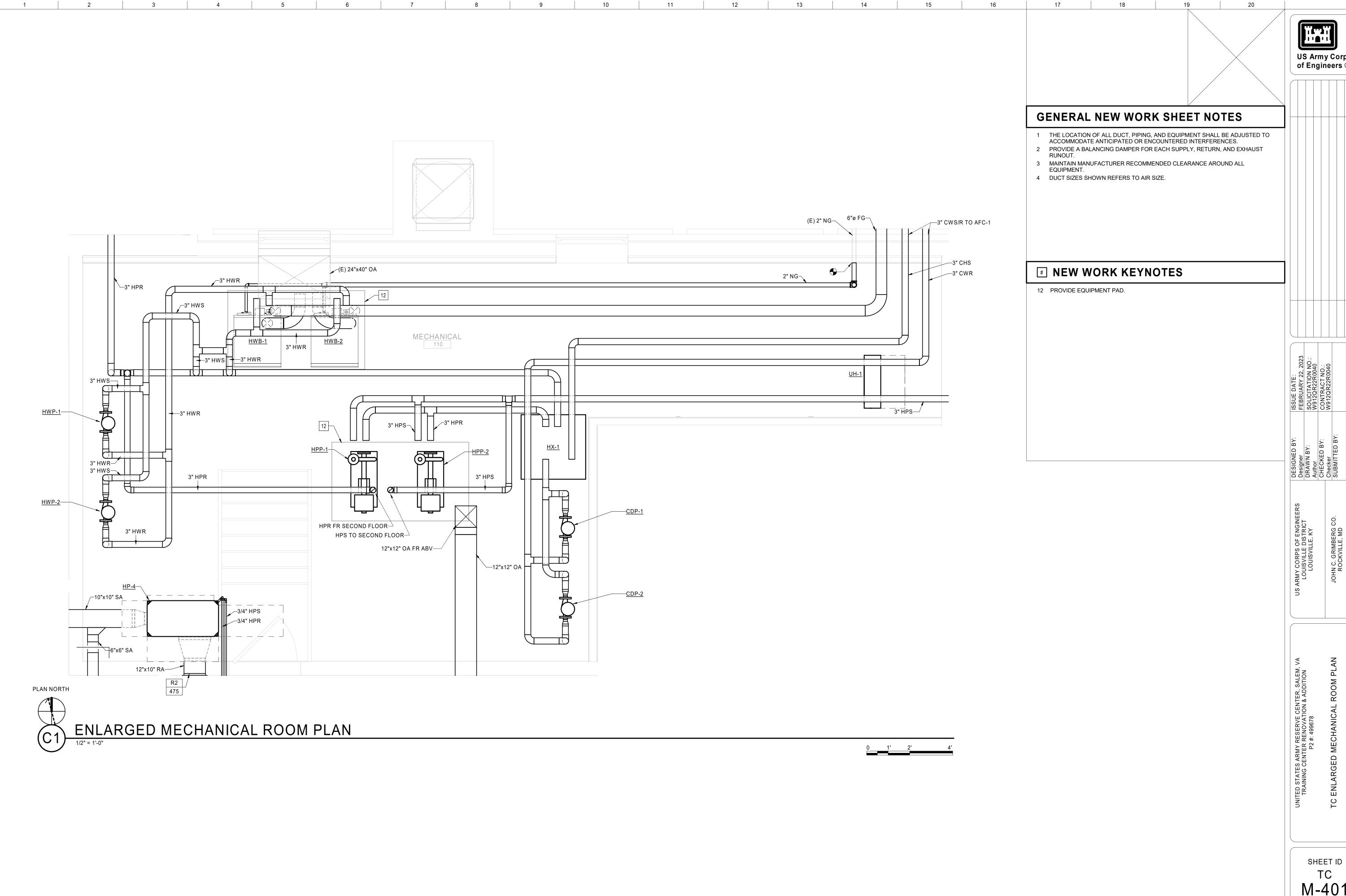
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ATES ARMY RESERVE CENTER, SALEM, VA
ING CENTER RENOVATION & ADDITION
P2 #: 499678

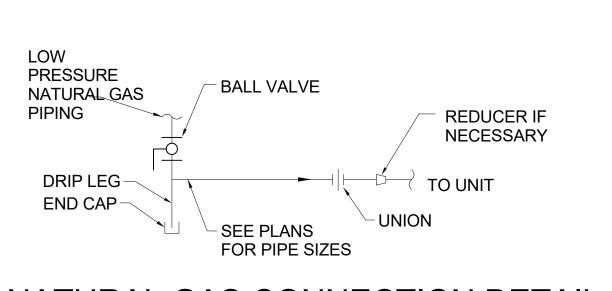
MECHANICAL PLAN - ROOF

TRAINI

SHEET ID

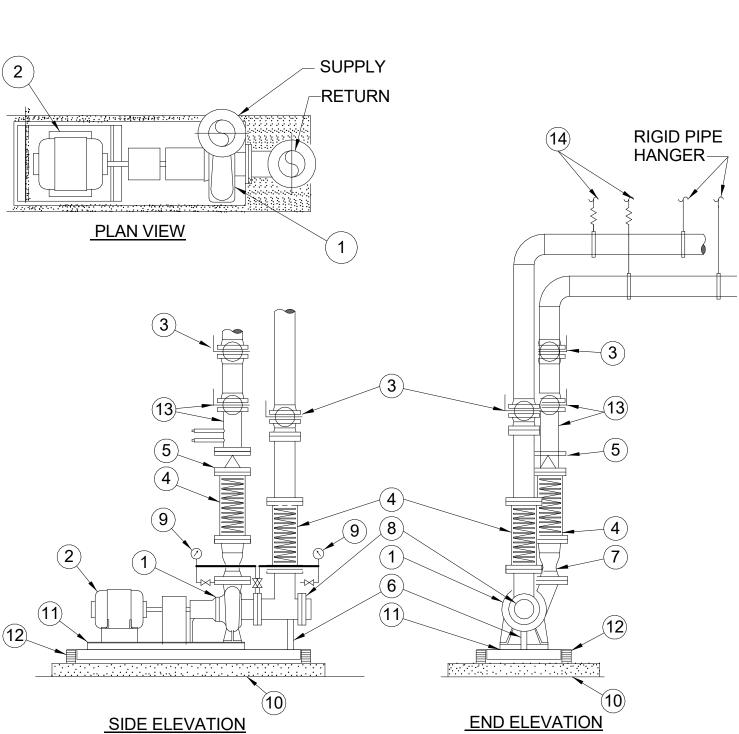


US Army Corps of Engineers ®



NATURAL GAS CONNECTION DETAIL

SCALE: NONE



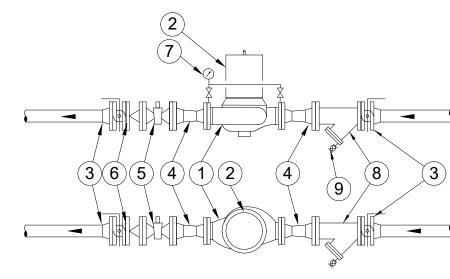
- 1. END SUCTION, SINGLE STAGE PUMP
- 2. MOTOR
- BUTTERFLY VALVE
- 4. FLEXIBLE CONNECTOR SPRING CHECK VALVE
- PIPE SUPPORT
- CONCENTRIC REDUCER SUCTION DIFFUSER
- PRESSURE GAUGE MANIFOLD WITH FULL PORT BALL VALVES
- 10. 4" CONCRETE EQUIPMENT PAD
- PUMP AND MOTOR BASEPLATE 12. INERTIA BASE WITH SPRING ISOLATORS
- 13. COMBINATION VENTURI/BUTTERFLY OR BALL VALVE W/MEMORY STOP. PROVIDE SPOOL PIECE BETWEEN CHECK VALVE AND VENTURI IF REQUIRED BY MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR UPSTREAM
- **CLEARANCES**
- 14. FIRST 3 HANGERS FOR EACH PIPE AND BRANCH SHALL BE SPRING & NEOPRENE TYPE. TYPE "H" FOR 4" DIA. PIPE &
 - SMALLER. TYPE "H-P" FOR 5" DIA. PIPE & LARGER

END SUCTION SINGLE STAGE PUMP

SCALE: NONE

NOTES:

- 1. ALL VALVES, STRAINERS, FITTINGS ETC. SHALL BE FULL LINE SIZE.
- 2. PROVIDE SPOOL PIECE AS NECESSARY TO MAINTAIN NOT LESS THAN 4" BETWEEN FLANGES ON PUMP INLET AND OUTLET FITTINGS.
- 3. TRIPLE DUTY VALVES ARE NOT ALLOWED.



- 1. IN-LINE CIRCULATOR PUMP
- 2. MOTOR
- 3. BUTTERFLY VALVE
- (BALL VALVE 2" OR SMALLER) 8. Y-TYPE STRAINER
- 7. PRESSURE GAUGE
- 4. CONCENTRIC REDUCER 9. GATE VALVE WITH NIPPLE AND CAP

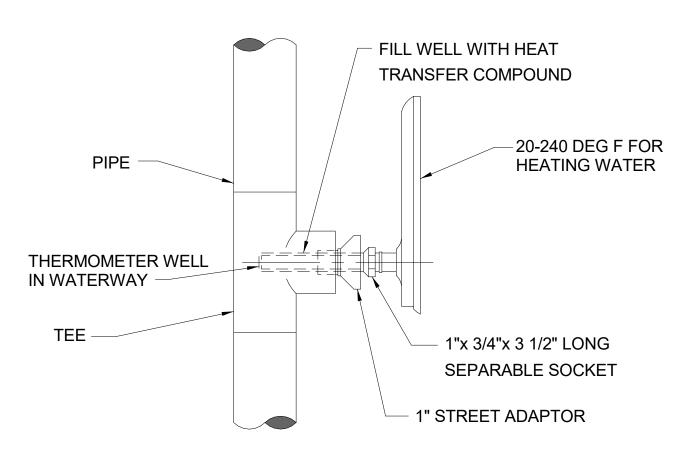
5. BALANCING VALVE

6. CHECK VALVE

IN-LINE BOILER CIRCULATOR PUMP

SCALE: NONE

- PROVIDE A SECTION OF STRAIGHT PIPE WITH A LENGTH OF 5 TIMES ITS DIAMETER BETWEEN THE SUCTION SIDE OF THE PUMP AND THE FIRST ELBOW.
- ALL VALVES, STRAINERS, FITTINGS ETC. SHALL BE FULL LINE SIZE
- PROVIDE WATER HEATER CIRCULATION PUMPS IN ACCORDANCE WITH WATER HEATER MANUFACTURER'S INSTALLATION INSTRUCTIONS.



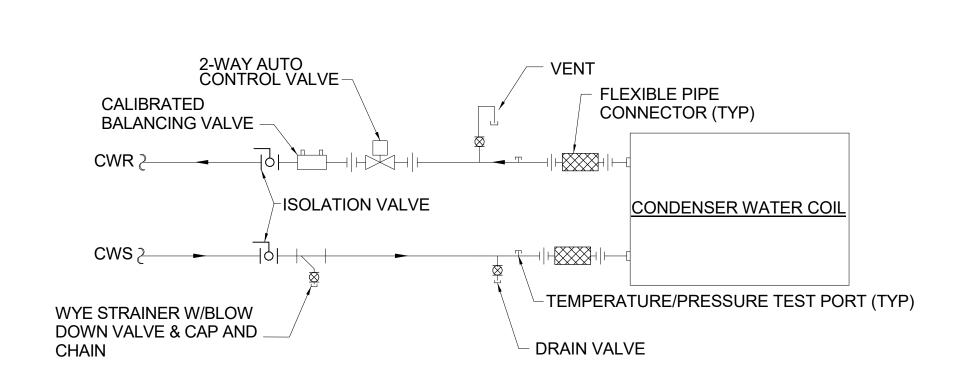
TYPICAL THERMOMETER **INSTALLATION DETAIL**

SCALE: NONE

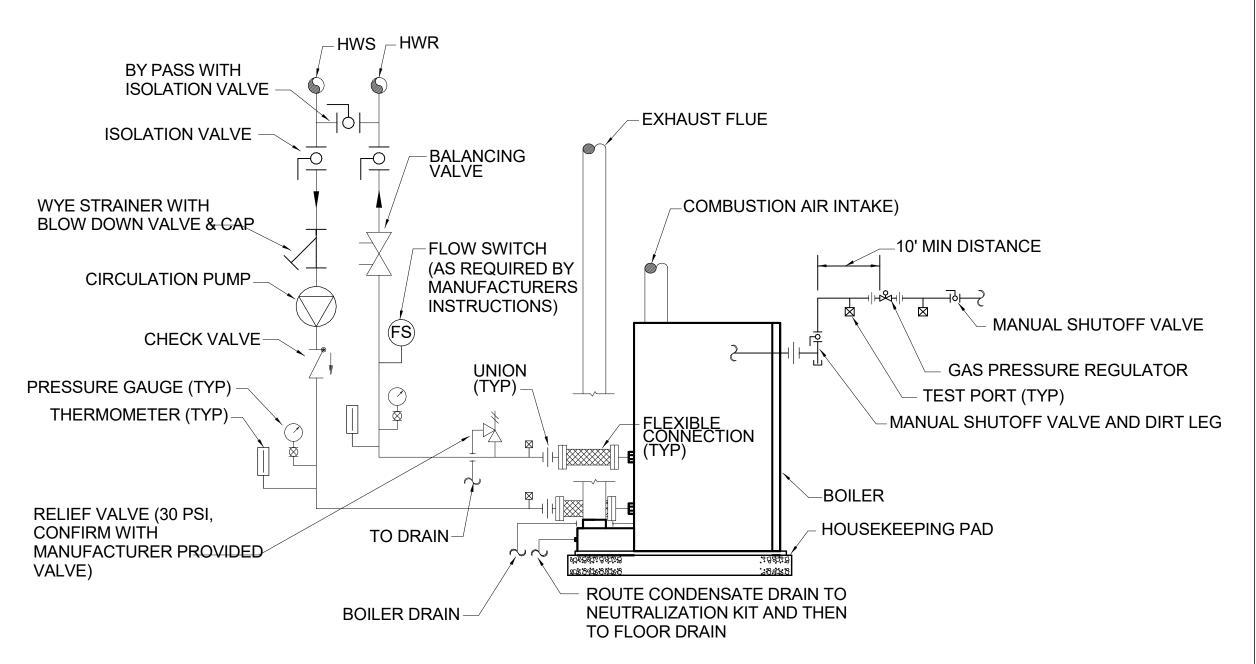
ELECTRONICS ENCLOSURE FULL PORT ISOLATION VALVE **WELD-O-LET FLOW**

HYDRONIC FLOW METER DETAIL

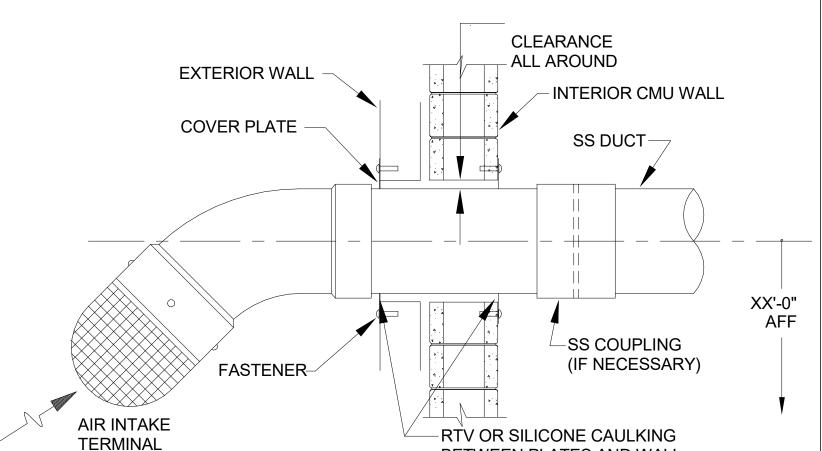
- REFER TO MANUFACTURER'S RECOMMENDATIONS FOR UPSTREAM AND DOWNSTREAM DISTANCES REQUIRED. INSTALL STRAIGHTENING VANES TO ACHIEVE REQUIRED DISTANCES IF NECESSARY.
- METER INSERTION DEPTH SHALL BE PER MANUFACTURER'S GUIDELINES. METER MUST ALWAYS BE PERPENDICULAR TO THE PIPE. INSTALLATION IN VERTICAL RUN PIPES IS ALSO ACCEPTABLE.
- PROVIDE SUFFICIENT CLEARANCE FOR METER REMOVAL AND MAINTENANCE



WSHP COIL PIPING WITH 2-WAY VALVE



CONDENSING GAS FIRED BOILER PIPING CONNECTION DETAIL SCALE: NONE



BOILER HORIZONTAL AIR INTAKE DETAIL SCALE: NONE

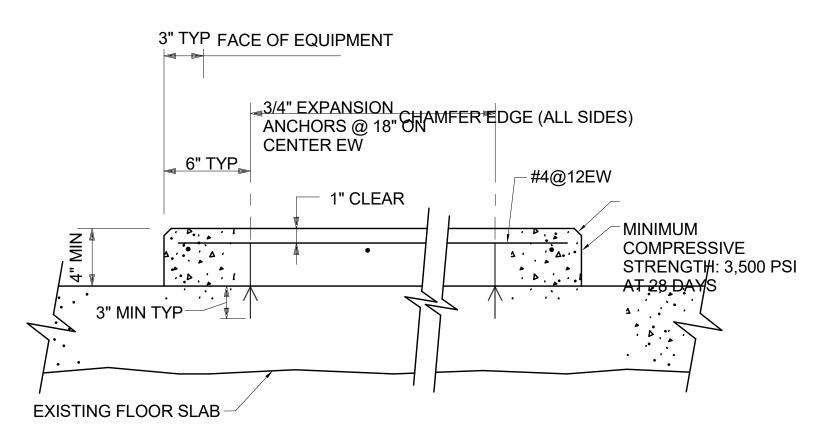
FATES ARMY RESERVE CENTER, SALEM IING CENTER RENOVATION & ADDITION P2 #: 499678 RTV OR SILICONE CAULKING BETWEEN PLATES AND WALL SHEET ID INTERIM

IN C. GRIMBERG (ROCKVILLE, MD

US Army Corps

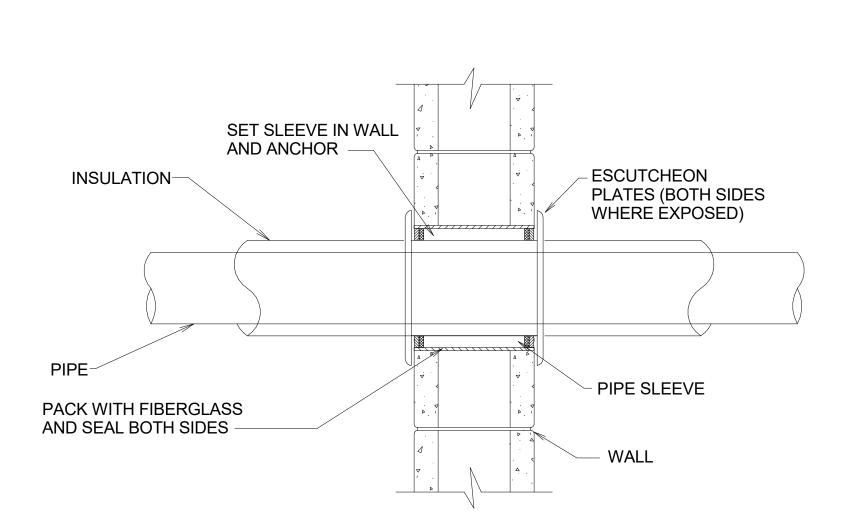
of Engineers ®

CONCRETE PAD FOR DUCTLESS SPLIT SYSTEM DETAIL

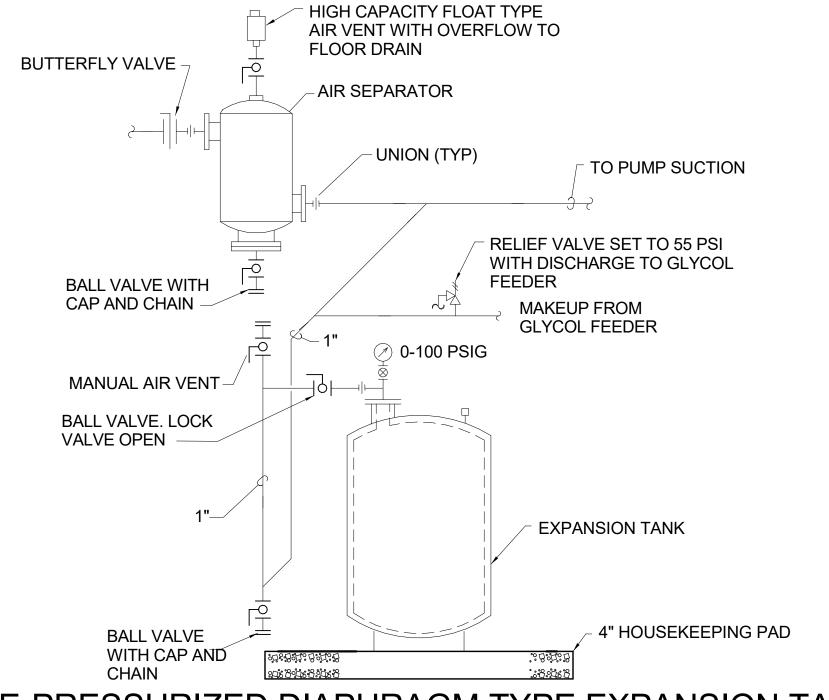


SCALE: NONE

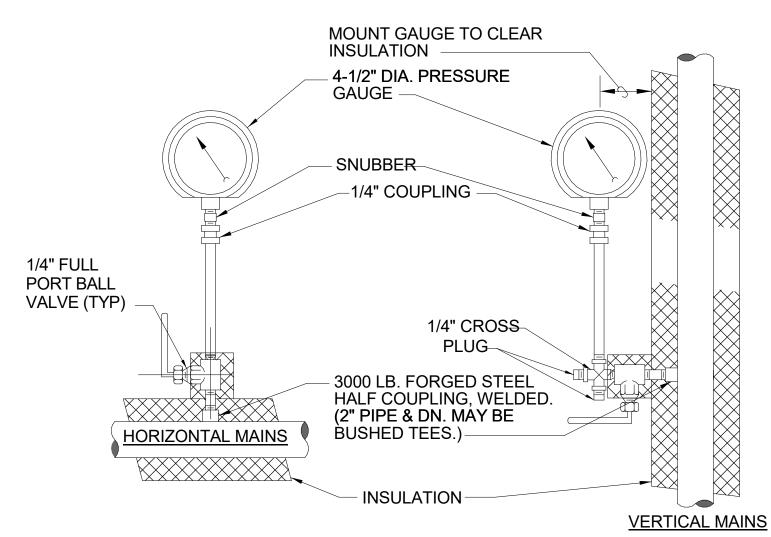
TYPICAL EQUIPMENT PAD ON FLOOR SLAB SCALE: NONE



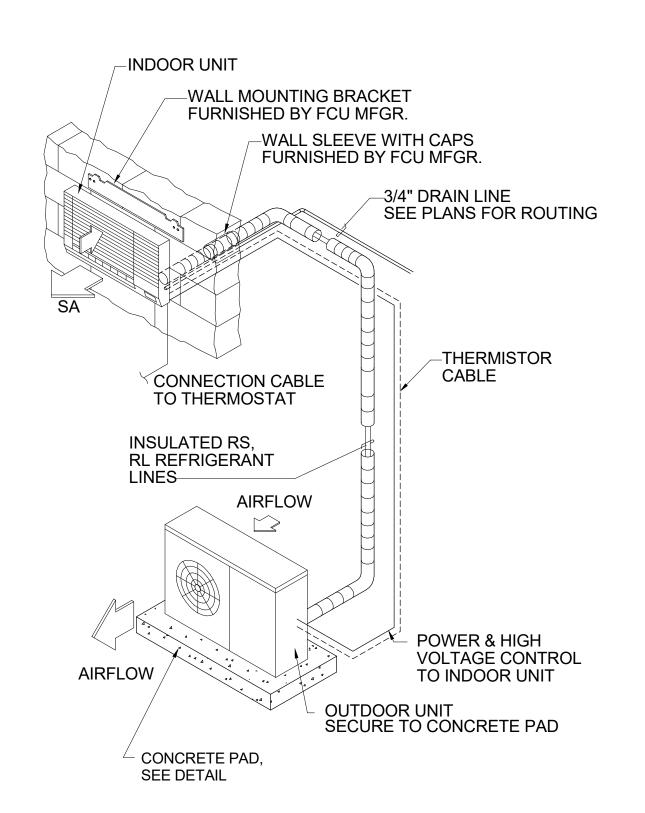
PIPE SLEEVE THRU INTERIOR WALL DETAIL SCALE: NONE



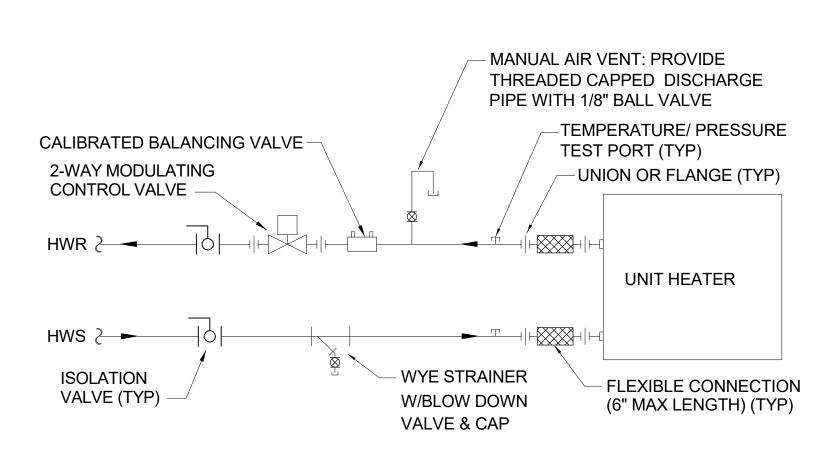
PRE-PRESSURIZED DIAPHRAGM TYPE EXPANSION TANK SCALE: NONE



HOT WATER GAUGE ASSEMBLY
SCALE: NONE



DUCTLESS SPLIT SYSTEM DETAIL SCALE: NONE



TERMINAL UNIT HOT WATER PIPING WITH 2-WAY CONTROL VALVE

SCALE: NONE

HN C. GRIMBERG (ROCKVILLE, MD

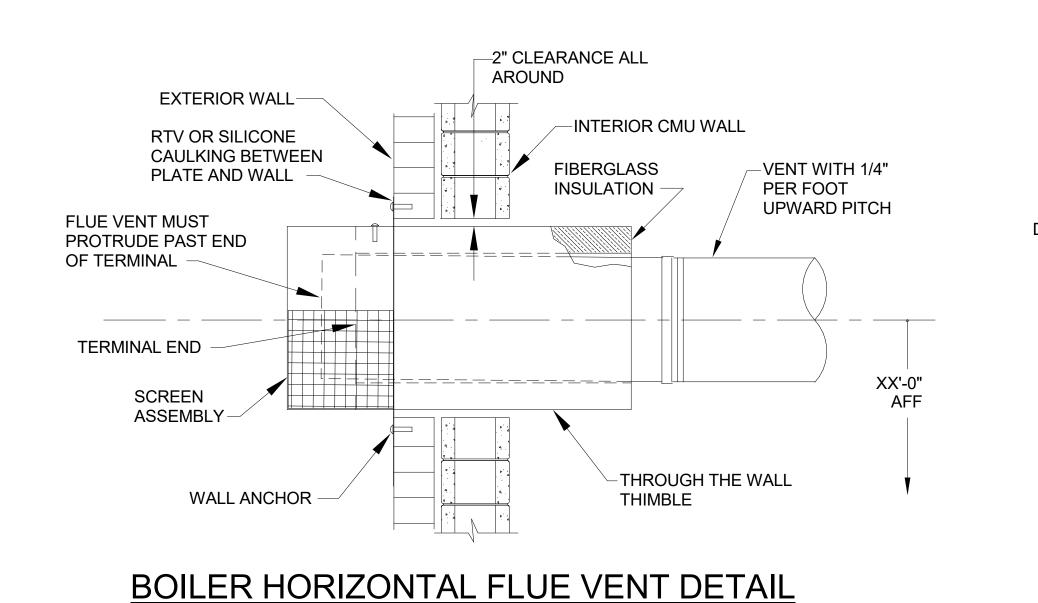
US Army Corps

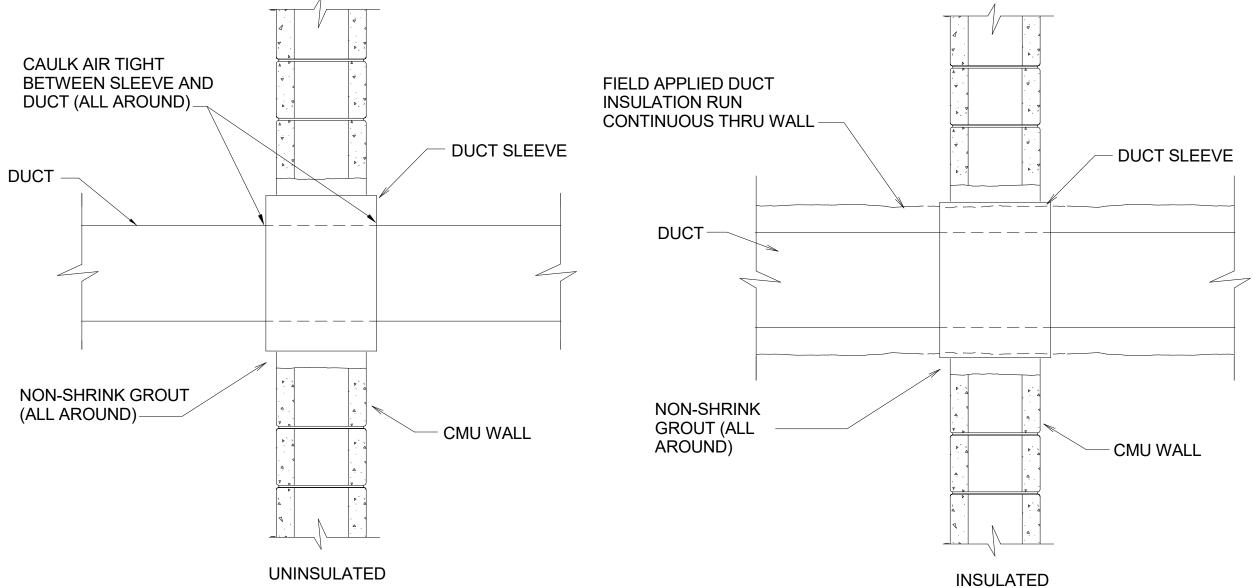
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ARMY RESERVE CENTER, SALEM, VA
ENTER RENOVATION & ADDITION
P2 #: 499678

TC DETAILS

SHEET ID



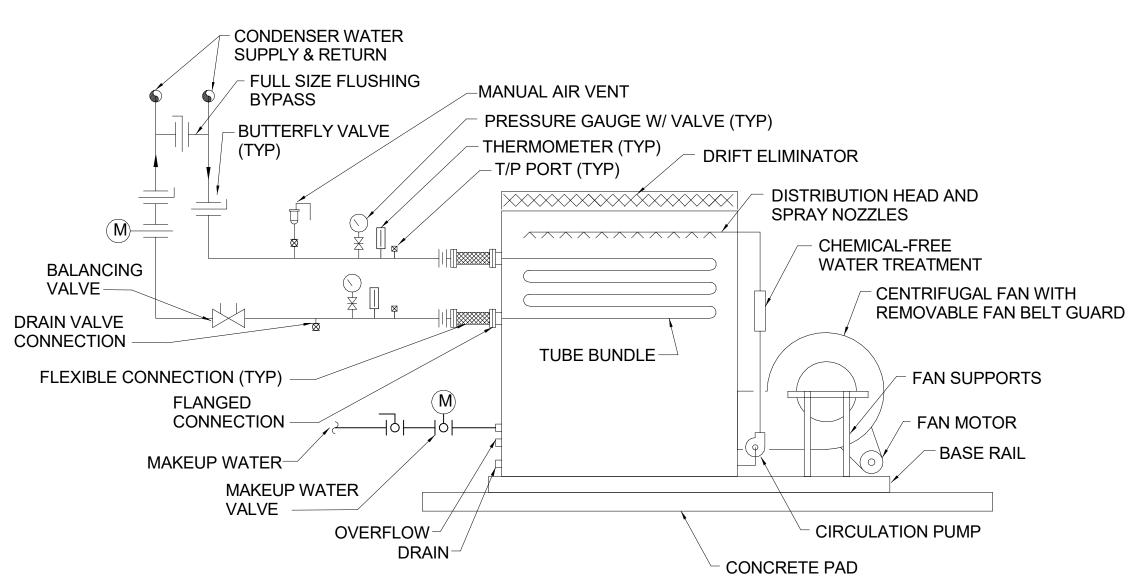


SCALE: NONE

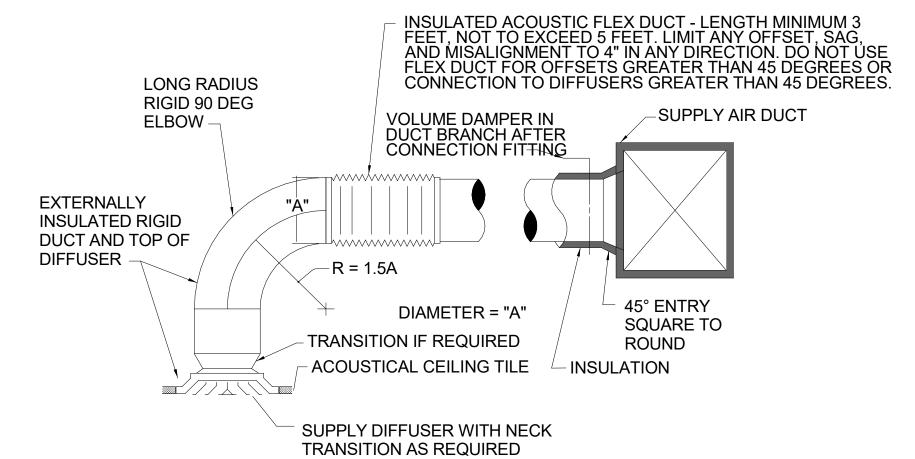
12

13

DUCT PENETRATION DETAIL



CLOSED CIRCUIT COOLING TOWER PIPING CONNECTION



TYPICAL CEILING SUPPLY DIFFUSER CONNECTION SCALE: NONE

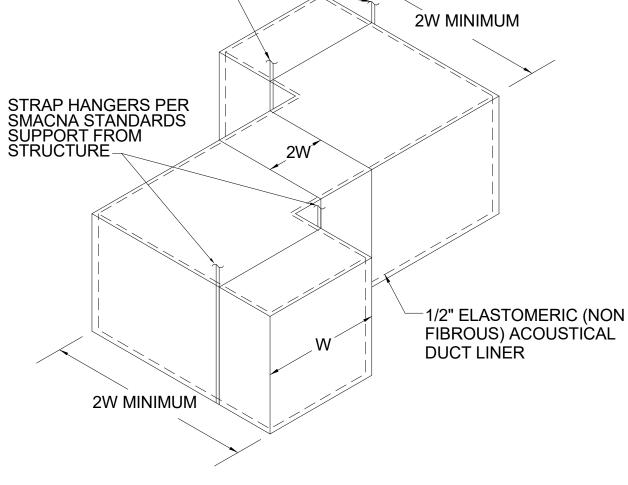
EXHAUST DUCT (SEE PLANS FOR SIZES)

VOLUME DAMPER IN DUCT BRANCH AFTER CONNECTION FITTING

CONNECTION FITTING

45° ENTRY

TYPICAL CEILING EXHAUST GRILLE
SCALE: NONE



STRAP HANGERS PER SMACNA STANDARDS

SUPPORT FROM

STRUCTURE

CEILING TRANSFER Z-DUCT

SCALE:

NOTES:

- SEE DRAWINGS FOR SPECIFIC DUCT SIZES AND ACCESSORIES SUCH AS FIRE DAMPERS, SECURITY BARS, OR OTHER PROTECTIVE MEASURES. PROVIDE ACCESS DOORS WHERE REQUIRED. DUCT SIZE INDICATED ON PLANS REFERS TO CLEAR INSIDE DIMENSIONS.
- SOME TRANSFER DUCTS MAY BE DUCTED TO GRILLES. SEE PLANS.

CENTER, SALEM, VA
ION & ADDITION

LOUISVILLE DISTRICT

LOUISVILLE, KY

JOHN C. GRIMBERG CO.

ROCKVILLE, MD

US Army Corps of Engineers ®

ED STATES ARMY RESERVE CENTER, SALEM FRAINING CENTER RENOVATION & ADDITION P2 #: 499678

TC DFTAILS

SHEET ID

M-503

FLEX

SCALE: NONE

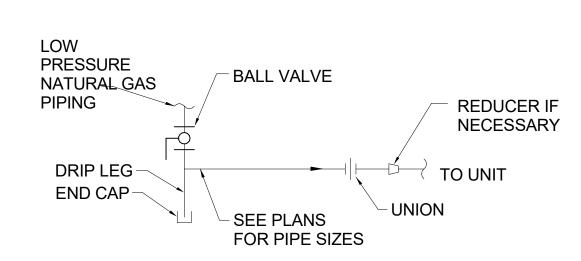
DETAIL

SCALE: NONE

D

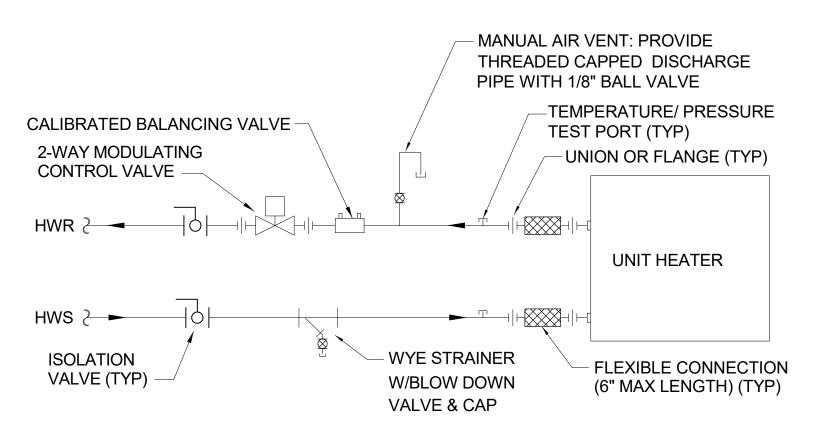
С

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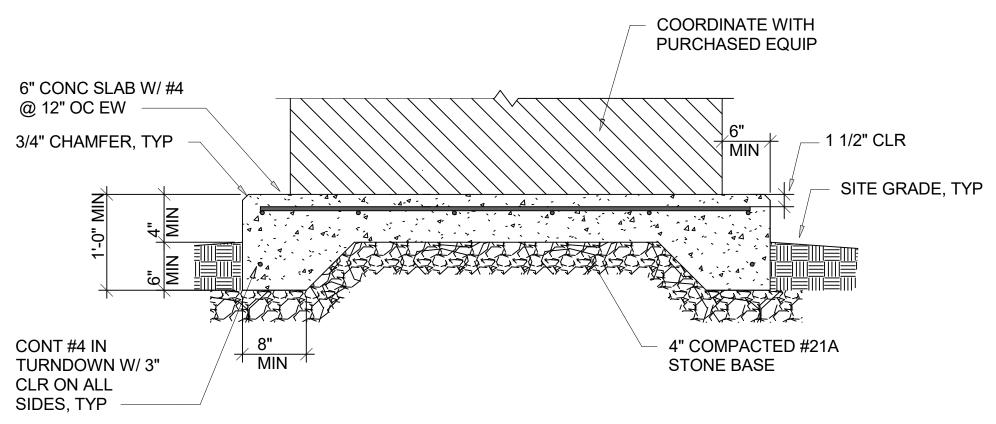
NATURAL GAS CONNECTION DETAIL

SCALE: NONE



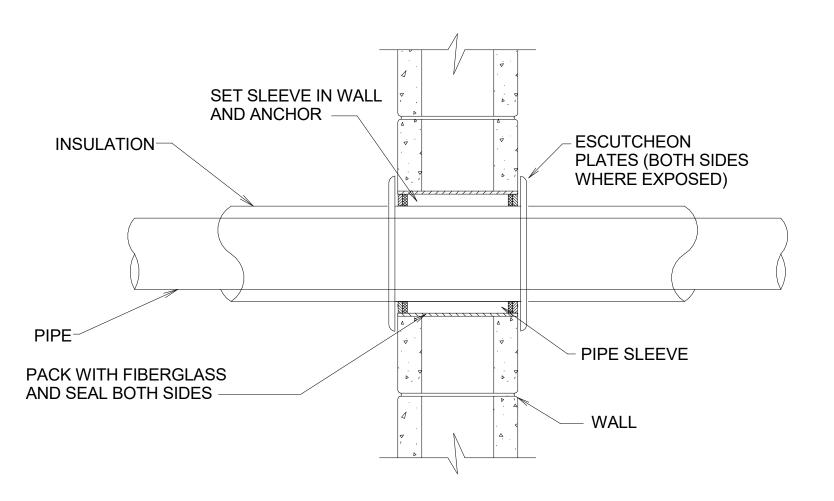
TERMINAL UNIT HOT WATER PIPING WITH 2-WAY CONTROL VALVE

SCALE: NONE



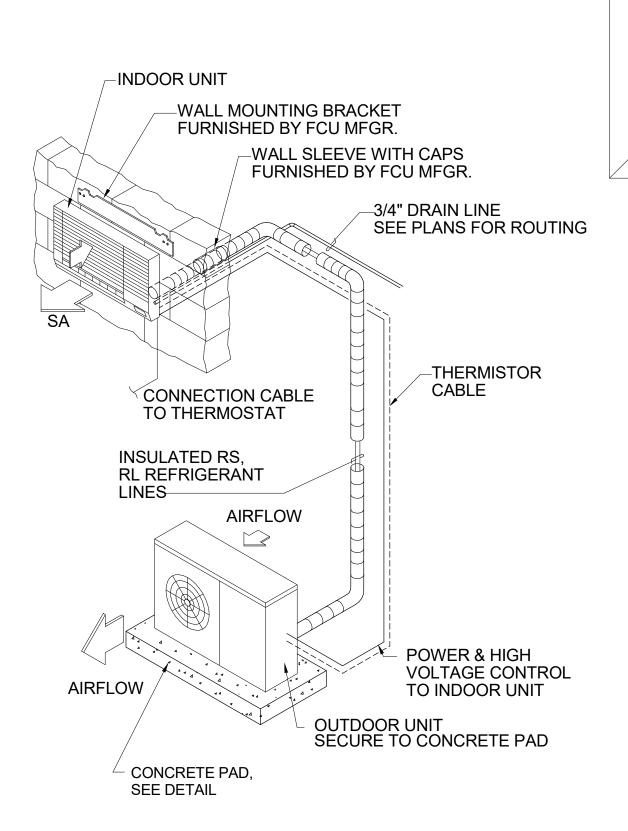
CONCRETE PAD FOR DUCTLESS SPLIT SYSTEM DETAIL

SCALE: NONE



PIPE SLEEVE THRU INTERIOR WALL DETAIL

SCALE: NONE



DUCTLESS SPLIT SYSTEM DETAIL

SCALE: NONE

US ARMY CORPS OF ENGINEERS

LOUISVILLE DISTRICT

LOUISVILLE, KY

LOUISVILLE, KY

KEL / TEA

JOHN C. GRIMBERG CO.

SUBMITTED BY:

ROCKVILLE, MD

SIZE:

ARB

FEBRUARY 22, 2023

W912QR22R0040

CHECKED BY:

W912QR22R0040

SIZE:

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US Army Corps of Engineers ®

ARMY RESERVE CENTER, SALEM, VA INTER RENOVATION & ADDITION P2 #: 499678

M-521

ACU	SCHEDULE			AIR COOLED F
DESIGNATION	ACU-1	ACU-2	ACU-3	DESIGNATION
LOCATION	ASSEMBLY HALL ROOF	EAST ROOF	WEST ROOF	LOCATION
TYPE	OUTDOOR WSHP	OUTDOOR WSHP	OUTDOOR WSHP	TYPE
TOTAL UNIT AIRFLOW (CFM)	5,000	1,000	1,900	12
QUANTITY	1	1	1	MANUFACTURER BASIS OF DESIGN
FAN TYPE	FORWARD CURVE	FORWARD CURVE	FORWARD CURVE	MODEL NUMBER BASIS OF DESIGN
	DIRECT DRIVE WITH	DIRECT DRIVE WITH	DIRECT DRIVE WITH	NUMBER OF CELLS
Z CONTROL TIPE	VFD	VFD	VFD	NOMINAL CAPACITY (MBH)
CONTROL TYPE EXTERNAL STATIC PRESSURE (IN WC) MOTOR SPEED (RPM)	1.5	1.5	1.5	FLOW RATE (GPM)
WOTOK SI ELD (KI W)	1,800	1,800	1,800	` '
MOTOR POWER, EACH (HP)	3	1	1	ENTERING WATER TEMPERATURE (°F)
OUTSIDE AIRFLOW (CFM)	950	800	1,300	LEAVING WATER TEMPERATURE (°F)
OUTSIDE AIR TEMPERATURE DB/WB (°F)	92.1/72.6	92.1/72.6	92.1/72.6 92.1/72.6	WB DESIGN (°F)
ENTERING AIR TEMPERATURE DB/WB (°F) LEAVING AIR TEMPERATURE DB/WB (°F) TOTAL CARACITY (MRH)	77.4/63.9 54.1/53.8	92.1/72.6 48.9/48.7	92.1/72.6 54.6/54.3	INLET CONNECTION (IN)
TOTAL CAPACITY (MBH)	148	43	63	OUTLET CONNECTION (IN)
SENSIBLE CAPACITY (MBH)	127	27	40	FAN MOTOR HORSEPOWER (HP)
SENSIBLE CAPACITY (MBH) FACE VELOCITY (FPM) AIR PRESSURE DROP (IN WC) ENTERING WATER TEMPERATURE (°E)	500	500	500	FLUID
AIR PRESSURE DROP (IN WC)	0.35	0.10	0.19	SPRAY PUMP HORSEPOWER (HP)
LINILINING WATER TEMPERATURE (1)	86	86	86	` '
LEAVING WATER TEMPERATURE (°F)	96.4	110	100	ELECTRICAL - VOLTAGE/PHASE/FREQUEN
OUTSIDE AIR TEMPERATURE DB (°F)	19.8	19.8	19.8	REMARKS
ENTERING AIR TEMPERATURE DB (°F) LEAVING AIR TEMPERATURE DB (°F)	58.8	19.8	19.8	REMARKS LEGEND:
	93.2 169	113 47	101 66	1. PROVIDE SOUND ATTENUATOR.
FACE VELOCITY (FPM)	500	500	500	2. PROVIDE WATER TREATMENT SYSTEM.
TOTAL CAPACITY (MBH) FACE VELOCITY (FPM) AIR PRESSURE DROP (IN WC)	0.35	0.10	0.19	3. PROVIDE VFD FOR FAN.
里 ENTERING WATER TEMPERATURE (°F)	68	68	68	
LEAVING WATER TEMPERATURE (°F)	58.8	44	55	EVDANIOIONI TANII
FLUID	WATER	WATER	WATER	EXPANSION TANK
FLUID FLOW (GPM)	30	3	8	DESIGNATION
FLUID PRESSURE DROP (FT H2O)	5.9	1.2	3.2	
PRE-FILTER - 2 INCH FINAL FILTER - 4 INCH	MERV8 MERV13	MERV8 MERV13	MERV8 MERV13	LOCATION
UNIT LENGTH (IN)	147	161	161	SERVICE
UNIT WIDTH (IN)	86	52	52	TYPE
UNIT HEIGHT (IN)	81	55	55	MINIMUM TANK SIZE (GAL)
UNIT WEIGHT (LBS)	2815	1909	1909	MINIMUM ACCEPTANCE VOLUME (GAL)
→ VOLTAGE (V)	460	460	460	FILL PRESSURE (PSI)
PHASE FREQUENCY (Hz) FLA (AMPS) MINIMUM CIRCUIT AMPS (A) MAX FLIXE SIZE (A)	3	3	3	PRECHARGE PRESSURE (PSI)
FREQUENCY (Hz)	60	60	60	` '
FLA (AMPS) MINIMUM CIRCUIT AMPS (A)	12.7 14.8	12.4 14.4	12.7 14.8	RELIEF VALVE PRESSURE SETTING (PSI)
MAX FUXE SIZE (A)	20	20	20	
BASED ON	TRANE	TRANE	TRANE	
MODEL	HORIZON K144	HORIZON B048	HORIZONB060	
HEAT PUMP REFRIGERANT	R410A	R410A	R410A	DESIGN
REMARKS	1, 2, 3, 4, 5, 6 & 7	1, 2, 3, 4, 5, 6 & 7	1, 2, 3, 4, 5, 6 & 7	USAGE
REMARKS LEGEND:				LOCATION
1. PROVIDE UNIT MOUNTED AND WIRED VFD FOR EACH F				DESCRI
2. PROVIDE PREMIUM EFFICIENCY MOTORS RATED FOR I	USE WITH VARIABLE FREQU	JENCY DRIVE.		MANUFA
3. PROVIDE 120V CONVENIENCE OUTLET.				MODEL
4. EXTERNAL STATIC PRESSURES SHOWN DO NOT INCLU	JDE DIRTY FILTER LOSS.			FAN DATA
5. PROVIDE BACKDRAFT DAMPERS FOR EACH FAN.				1

AIR COOLED FLU	ID COOLER
DESIGNATION	AFC-1
LOCATION	YARD MECH ROOM
TYPE	CLOSED CIRCUIT EVAPORATIVE FLUID COOLER
MANUFACTURER BASIS OF DESIGN	EVAPCO
MODEL NUMBER BASIS OF DESIGN	LRWB 5-5H6-Z-C
NUMBER OF CELLS	1
NOMINAL CAPACITY (MBH)	512
FLOW RATE (GPM)	109
ENTERING WATER TEMPERATURE (°F)	96.0
LEAVING WATER TEMPERATURE (°F)	84
WB DESIGN (°F)	78
INLET CONNECTION (IN)	4.0
OUTLET CONNECTION (IN)	4.0
FAN MOTOR HORSEPOWER (HP)	7.5
FLUID	35% PROPYLENE GLYCOL
SPRAY PUMP HORSEPOWER (HP)	1
ELECTRICAL - VOLTAGE/PHASE/FREQUENCY	460/3/60
REMARKS	1, 2 & 3
REMARKS LEGEND:	
1. PROVIDE SOUND ATTENUATOR.	
2. PROVIDE WATER TREATMENT SYSTEM.	
3. PROVIDE VFD FOR FAN.	

EXPANSION TANK SCHEDULE

DESIGNATION

DESCRIPTION

LOCATION

REMARKS

ET-1

110 MECHANICAL

HEAT PUMP LOOP

DIAPHRAGM

22

20

20

75

EXTERNAL STATIC PRESSURE (IN WC)

1. PROVIDE FAN WITH UNIT MOUNTED DISCONNECT.

MANUFACTURER BASIS OF DESIGN

MODEL BASIS OF DESIGN

RPM

PHASE

MAXIMUM dBA AT 5 FEET

REMARKS LEGEND:

AIRFLOW (SCFM)
EXTERNAL STATIC

DRIVE TYPE

HORSEPOWER

VOLTAGE (V)

3. PROVIDE BACKDRAFT DAMPER.

FREQUENCY (Hz)

EXHAUST FAN SCHEDULE

2. PROVIDE FAN WITH ELECTRONICALLY COMMUTATED MOTOR (ECM) AND WITH ADJUSTABLE SPEED.

RESTROOM EXHAUST

G-103 ROOF

GREENHECK

G-070-VG

200

0.4 1,642

DIRECT

1/15

1,800

1, 2 & 3

CENTRIFUGAL DOWNBLAST | CENTRIFUGAL DOWNBLAST

- 1			
	DESIGNATION	HWB-1	HWB-2
	LOCATION	MECH ROOM	MECH ROOM
	BOILER TYPE	CONDENSING FIRE TUBE	CONDENSING FIRE TUBE
	MANUFACTURER BASIS OF DESIGN	FULTON	FULTON
-	MODEL NUMBER BASIS OF DESIGN	EXE-399	EXE-399
+	FUEL TYPE	NATURAL GAS	NATURAL GAS
	REQUIRED OUTPUT (MBH)	391,020	391,020
-	MINIMUM TURNDOWN RATIO	8:1	8:1
1	AHRI EFFICIENCY RATING (%)	98.0	98.0
	IGNITION TYPE	ELECTRIC	ELECTRIC
	GAS TRAIN CONNECTION (IN)	2	2
	MINIMUM INLET GAS PRESSURE (IN WC)	3.5	3.5
	MAXIMUM INLET GAS PRESSURE (IN WC)	14.0	14.0
	FLOW RATE (GPM)	38	38
	HEAD LOSS (FT H20)	2.75	2.75
	DELTA-T (°F)	20	20
	PRESSURE VESSEL VOLUME (GAL)	10.4	10.4
-	VOLTAGE (V)	120	120
	PHASE	1	1
	FREQUENCY (Hz)	60	60
	MINIMUM CIRCUIT AMPS (A)	7.5	7.5
	FLUE GAS STACK EXHAUST CONNECTION SIZE (IN)	4.5	4.5
	COMBUSTION AIR INLET CONNECTION SIZE (IN)	4	4
	REMARKS	1, 2	1, 2
	REMARKS LEGEND:		
	1. PROVIDE CSD-1 BURNER CONTROLS.		

2. PROVIDE FLUE AND INTAKE PER MANUFACTURERS INSTRUCTIONS AND SPECIFICATIONS.

RESTROOM EXHAUST

G-202 ROOF

GREENHECK

G-090-VG

500

0.4

1,513

DIRECT

1/10

1,800

115

1, 2 & 3

2. PROVIDE INTEGRAL DISCONNECT.

3. PROVIDE WALL RECESSED CABINET AND INTEGRAL THERMOSTAT.

BOILER SCHEDULE

AIR SEPARATOR SCHEDULE					
DESIGNATION	AS-1	AS-2	AS-3		
LOCATION	MECH ROOM	MECH ROOM	MECH ROOM		
SERVICE	HEAT PUMP LOOP	HOT WATER LOOP	CONDENSER LOOF		
LINE SIZE (IN)	3	3	3		
DESIGN FLOW RATE (GPM)	130	76	110		
MAXIMUM PRESSURE DROP (FT H2O)	2	2	2		

AIR SEPARATOR SCHEDULE						
DESIGNATION	AS-1	AS-2	AS-3			
LOCATION	MECH ROOM	MECH ROOM	MECH ROOM			
SERVICE	HEAT PUMP LOOP	HOT WATER LOOP	CONDENSER LOOP			
LINE SIZE (IN)	3	3	3			
DESIGN FLOW RATE (GPM)	130	76	110			
MAXIMUM PRESSURE DROP (FT H2O)	2	2	2			

	DUCTLESS SPLIT SYSTEM HEAT PUMP SCHEDULE								
INDOOR	UNIT DESIGNATION	ON	SS-1A & SS-1B		SS-3A & SS-3B				
OUTDOO	R UNIT DESIGNA	TION	CU-1	CU-2	CU-2				
ROOMS	SERVED		EL02 & ELECTRICA-102	EF-116 & ELEC-218	TER-118 & TER-222				
<u> </u>		AIRFLOW (H/M/L/SL)	310/280/249/142	310/280/249/142	310/280/249/142				
LNO LNO	EVAPORATOR	RATED TOTAL COOLING CAPACITY (MBH)	7	7	7				
		RATED TOTAL HEATING CAPACITY (MBH)	7	7	7				
NDOOR		VOLTAGE (V)	208	208	208				
Ì	ELECTRICAL	PHASE	1	1	1				
		FREQUENCY (Hz)	60	60	60				
REFRIGE	ERANT		R-410A	R-410A	R-410A				
		AMBIENT DESIGN TEMPERATURE (°F)	95	95	95				
L NO		MINIMUM CIRCUIT AMPACITY (A)	10.9	10.9	10.9				
	ELECTRICAL	RECOMMENDED FUSE SIZE (A)	15	15	15				
	LLLOTRICAL	VOLTAGE (V)	208	208	208				
OUTDOOR		PHASE	1	1	1				
		FREQUENCY (Hz)	60	60	60				
BASIIS C	F DESIGN MANUF	FACTURER	TRANE	TRANE	TRANE				
MODEL (OUTDOOR		2MX18AXVJU	2MX18AXVJU	2MX18AXVJU				
MODEL I	NDOOR		CTX07AXVJU	CTX07AXVJU	CTX07AXVJU				

REMARKS LEGEND:			
1. POWER FROM OUTDOOR UNIT, OUTDOOR UNIT POWER INCLUDES EVAPORATO	R POWER. I	NSTALL PER MANUFAC	TURER'S
INSTRUCTIONS, ADJUST CHARGE AS NEEDED FOR REFRIGERANT PIPE I ENGTH.			

1, 2, 3, & 4

1, 2, 3, & 4

2. PROVIDE 3/4" CONDUIT BETWEEN INDOOR AND OUTDOOR UNIT.

REMARKS

1. PROVIDE WITH VARIABLE FREQUENCY DRIVE WITH BACNET TIE IN CAPABILITY. PROVIDE INVERTER DUTY MOTOR.

3. PROVIDE LOW AMBIENT OPERATION DOWN TO 0 DEG F OUTSIDE AIR. 4. PROVIDE CORROSION RESISTANT COATING ON CONDENSER COIL.

			PUMP S	CHEDULE					
DESIGNATION HPP-1 HPP-2 CDP-1 CDP-2 HWP-1 HWP-2									
SERVIC	CE CE	HEAT PUMP LOOP	HEAT PUMP LOOP	CONDENSER LOOP	CONDENSER LOOP	BOILER LOOP	BOILER LOOP		
LOCAT	ION	110 MECHANICAL							
TYPE		END SUCTION	END SUCTION	IN-LINE	IN-LINE	IN-LINE	IN-LINE		
MANUF	ACTURER BASIS OF DESIGN	BELL&GOSSETT	BELL&GOSSETT	BELL&GOSSETT	BELL&GOSSETT	BELL&GOSSETT	BELL&GOSSETT		
MODEL	. BASIS OF DESIGN	E-1532 2BD	E-1532 2BD	E-90 2AAB	E-90 2AAB	E-90 2AB	E-90 2AB		
Δ4	FLOW (GPM)	130	130	110	110	76	76		
PUMP	TOTAL HEAD (FT-H2O)	64	64	37	37	27	27		
	MINIMUM EFFICIENCY (%)	71.6	71.6	65.4	65.4	71.3	71.3		
SUCTIO	ON CONNECTION SIZE (IN)	2.5	2.5	2	2	2	2		
DISCH	ARGE CONNECTION SIZE (IN)	2	2	2	2	2	2		
₹	HORSEPOWER	5	5	3	3	1	1		
DATA	RPM	1,800	1,800	3,600	3,600	1,800	1,800		
	VOLTAGE (V)	460	460	460	460	460	460		
MOTOR	PHASE	3	3	3	3	3	3		
M	FREQUENCY (HZ)	60	60	60	60	60	60		
REMAF	RKS	1	1	1	1	1	1		

		UNI	T HEATER	SCHEDU	LE			
DESIGN	IATION	UH-1	UH-2	UH-3	UH-4	UH-5	UH-6	UH-7
LOCATION		110 MECHANICAL	216 MECHANICAL	201 MECHANICAL	101 MECHANICAL	STA3 STAIR	STA2 STAIR	V100 WEST VES
AIRFLO\	W (CFM)	245	400	400	400	400	400	400
TYPE		HHW	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC
THROW		HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
MINIMUI	M CAPACITY (MBH)	9.2	11.2	11.2	11.2	10.2	10.2	10.2
ENTERII	NG AIR TEMPERATURE (°F)	55.0	55.0	55.0	55.0	55.0	55.0	55.0
<u> </u>	ENTERING WATER TEMPERATURE (°F)	140.0						
HOT WATER COIL	FLOW RATE (GPM)	1.9						
- ≥ 0	WATER PRESSURE DROP (FT-H2O)	2.2						
	POWER (kW)	0.025	3.3	3.3	3.3	3	3	3
ELECTRICAL DATA	VOLTAGE (V)	120	208	208	208	208	208	208
XX AT	PHASE	1	1	1	1	1	1	1
	FREQUENCY (HZ)	60	60	60	60	60	60	60
	MAX APM RATING		15.9	15.9	15.9	14.4	14.4	14.4
77 77	HP	16 W	1/125	1/125	1/125	1/125	1/125	1/125
MOTO R DATA	RPM	1550	1550	1550	1550	1600	1600	1600
BASED (ON	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL		S-A18	UHEC-031A	UHEC-031A	UHEC-031A	UHCA-031A7A	UHCA-031A7A	UHCA-031A7A
REMARI	KS	1	1 & 2	1 & 2	1 & 2	2 & 3	2 & 3	2 & 3

	WATER SOURCE HEAT PUMP SCHEDULE									
UNIT	DESIGNATION	HP-1	HP-2	HP-3	HP-4	HP-5	HP-6			
ROO	M SERVED	MULTIPLE	MULTIPLE	MULTIPLE	MULTIPLE	MULTIPLE	MULTIPLE			
ORIE	NTATION	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	VERTICAL CONSOLE	VERTICAL CONSOLE			
AIRF	LOW RATE (CFM)	215	285	380	475	290	480			
EXTE	ERNAL SP (IN-H20)	0.5	0.5	0.5	0.5	-	-			
FAN	HP	0.08	0.08	0.13	0.13	0.03	0.08			
FLOV	V RATE (GPM)	1.8	2.1	2.8	3.5	1.8	3.5			
MAX	PD (FT-H20)	2.9	3.1	2.0	3.0	3.0	3.0			
PIPIN	IG RUNOUT SIZE (IN)	1/2	1/2	3/4	3/4	1/2	3/4			
	TOTAL CAPACITY (MBH)	7.5	8.8	11.7	14.3	7.5	14.6			
COOLING	SENS CAPACITY (MBH)	5.5	7.3	9.5	12.3	6.4	11.9			
	EER	12.00	12.38	13.20	12.85	12.50	13.29			
ĕ	EWT (°F)	86.0	86.0	86.0	86.0	86.0	86.0			
	LWT (°F)	98.8	98.0	101.5	99.0	98.0	96.3			
U	CAPACITY (MBH)	9.9	11.5	14.4	18.3	9.1	17.3			
Ì	COP	4.3	4.56	4.69	4.3	4.7	4.61			
HEATING	EWT (°F)	68	68	68	68	68	68			
宝	LWT (°F)	58	58.4	56.2	58	59.2	59.8			
FILTE	ĒR	MERV 8	MERV 8							
VOL	TAGE (V) / PHASE / FEQUENCY (Hz)	208/1/60	208/1/60	208/1/60	208/1/60	208/1/60	208/1/60			
FLA ((A)	3.9	5.23	7	8.8	4.1	8.9			
МОС	P (A)	15	15	15	15	15	15			
REF	RIGERANT	R410A	R410A	R410A	R410A	R410A	R410A			
BASI	S OF DESIGN MANUFACTURER	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE			
MOI	DEL	AXIOM GEH006	AXIOM GEH009	AXIOM GEH012	AXIOM GEH015	AXIOM GEC006	AXIOM GEC015			
REM	ARKS									
REM	ARKS LEGEND:	•	•			•	•			

DE	SIGNATION	HX-1
LO	CATION	110 MECHANICAI
ΤY	PE	PLATE & FRAME
CA	PACITY (MBH)	210.4
OP	ERATING WEIGHT (LBS)	500
	FLUID	30% GLYCOL
	FLOW RATE (GPM)	109
Щ	ENTERING WATER TEMPERATURE (°F)	96
SID	LEAVING WATER TEMPERATURE (°F)	86
\vdash	WATER PRESSURE DROP (PSI) PERCENT GLYCOL	10
Ξ	PERCENT GLYCOL	30
	INLET CONNECTION SIZE (IN)	2.5
	OUTLET CONNECTION SIZE (IN)	2.5
	FLUID	WATER
	FLOW RATE (GPM)	130
핃	ENTERING WATER TEMPERATURE (°F) LEAVING WATER TEMPERATURE (°F)	98.8
S	LEAVING WATER TEMPERATURE (°F)	86
COLD	WATER PRESSURE DROP (PSI)	5
S	PERCENT GLYCOL	0
	INLET CONNECTION SIZE (IN)	2.5
	OUTLET CONNECTION SIZE (IN)	2.5
RE	MARKS	1

	DEHUMI	DIFIER SCHEDULE				
C	DESIGNATION	DH-1				
	LOCATION	ARMORY				
	TYPE	WATER ASSIST DEHUMIDIFIER				
	AIRFLOW (CFM)	650				
	CAPABITY (LB/HR)	6				
	ELECTRICAL DATA					
	INPUT POWER, MAX (kW)	2.15				
	VOLTAGE (V)	208				
	PHASE	1				
в	HERTZ	60				
	REFRIGERANT	R410A				
	MANUFACTURER	DEHUMIDIFIER CORPORATION OF AMERICA				
	MODEL	DCA 650AWH				
	REMARKS	ALL				
	REMARKS LEGEND:					
	1. PROVIDE FACTORY PROGRAMMABLE CONTROLLER WITH DISPLAY.					
Δ	2. PROVIDE CEILING MOUNTING BRACKET.					
`	3. CAPACITY BASED ON 82DB / 50% RH					
	4. PROVIDE BUILT-ON BLOWE	R PACK FOR DIRECT ROOM DEHUMIDIFICATION.				
	5. PROVIDE HUMIDITY SENSO	R FOR LOCAL MONITORING AND CONTROL.				

1. PROVIDE INTEGRAL DISCONNECT SWITCH.

4. PROVIDE SOUND ATTENUATION.

3. PROVIDE 1/2" NON FIBROUS INTERNAL LINER.

2. PROVIDE 24 V CONTROL POWER TRANSFORMER AS REQUIRED.

7. PROVIDE ROOF CURB.

		AIR	TERMINAL	SCHEDULE			
TAG NUMBER	S1	S2	R1	R2	EG-1	EG-2	DL-1
DESCRIPTION	SUPPLY DIFFUSER	SUPPLY DIFFUSER	RETURN GRILLE	RETURN GRILLE	EXHAUST GRILLE	EXHAUST GRILLE	DRUM LOUVER
TYPE	LAY-IN	SIDE WALL	LAY-IN	SIDE WALL	LAY-IN	SURFACE MOUNTED	DUCT MOUNTED
	ROUND	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
	A=6"		A=6"x6"		PER DRAWINGS	PER DRAWINGS	12"x10"
NEOK OLZE	B=8"		B=8"x8"	12"x8"			
NECK SIZE	C=10"	10"x8"	C=10"x10"				
			D=12"x12"				
			E=22"22"				
FRAME SIZE	24"x24"	12"x10"	24"x24"	14"x10"	24"x24"	PER DRAWINGS	PER DRAWINGS
AIR PATTERN	4-WAY	DOUBLE	PERFORATED	PERFORATED	PERFORATED	PERFORATED	JET OUTLET
MAX PRESSURE DROP (IN WC)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MAX NC RATING	25	25	25	25	25	25	35
MATERIAL	STEEL	STEEL	STEEL	STEEL	STEEL	STEEL	ALUMINUM
FINISH	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
REMARKS	1						1
REMARK LEGEND:	1			1	1		
1. OPPOSED BLADE DAMPER							

of Engineers ® 1, 2, 3, & 4

US Army Corps

1	EVUAUSI	FAN SCHEDULE	<u>-</u>
DESIGNATION	l	EF-3	EF-4
USAGE		RESTROOM EXHAUST	VEHICLE BAY EXHAUST
LOCATION		VMS ROOF	VMS ROOF
DESCRIPTION		CENTRIFUGAL DOWNBLAST	CENTRIFUGAL DOWNBLAST
MANUFACTUR	RER BASIS OF DESIGN	GREENHECK	GREENHECK
MODEL BASIS	OF DESIGN	G-090-VG	GB-180HP
AIRI	FLOW (SCFM)	425	2,000
A AIRI RPM RPM AIRI RPM DRI	TERNAL STATIC PRESSURE (IN WC)	0.4	0.6
Z RPN	M	1,405	952
L DRI	VE TYPE	DIRECT	BELT
	RSEPOWER	1/10	1/2
KPI RPI	M	1,800	1,800
MOTOR DATA LANGE STATE LANGE STATE LANGE STATE REPLACE STATE	LTAGE (V)	115	115
ĕ □ PHA	ASE	1	1
FRE	EQUENCY (Hz)	60	60
MAXIMUM dBA	A AT 5 FEET	51	60
REMARKS		1, 2 & 3	1, 3,4 & 5
REMARKS LEC	GEND:		
1. PROVIDE FA	AN WITH UNIT MOUNTED DISCONNE	CT.	
2. PROVIDE FA	AN WITH ELECTRONICALLY COMMUT	ATED MOTOR (ECM) AND WITH	HADJUSTABLE SPEED.
3. PROVIDE BA	ACKDRAFT DAMPER.		
4. PROVIDE SF	PARK RESISTANT ALUMINUM HOUSII	NG CONSTRUCTION	
5. PROVIDE VA	ARIABLE FREQUENCY DRIVE.		

DES	IGNATION	ACU-4	MAU-1	
	ATION	PHYSICAL READINESS ROOF	VEHICLE BAY ROOF	
TYPE		GAS/ELECTRIC ROOFTOP	GAS MAKEUP AIR UNIT	
	TOTAL UNIT AIRFLOW (CFM)	1,100	2,250	
SUPPLY FAN	QUANTITY	1	1	
	FAN TYPE	FORWARD CURVE	FORWARD CURVE	
	CONTROL TYPE	DIRECT DRIVE WITH VFD	DIRECT DRIVE WITH VFD	
Γ	EXTERNAL STATIC PRESSURE (IN WC)	1.0	1.0 1,800	
υ	MOTOR SPEED (RPM)	1,800		
0)	MOTOR POWER, EACH (HP)	3/4	1,000	
	, ,		-	
	OUTSIDE AIRFLOW (CFM)	450	2,250	
	OUTSIDE AIR TEMPERATURE DB/WB (°F)	92.1/72.6	-	
_	ENTERING AIR TEMPERATURE DB/WB (°F)	80.0/67.0	-	
COIL	LEAVING AIR TEMPERATURE DB/WB (°F)	56.4/55.0	-	
	TOTAL CAPACITY (MBH)	37	-	
COOLING	SENSIBLE CAPACITY (MBH)	28	-	
$S_{\mathcal{O}}$	FACE VELOCITY (FPM)	500	-	
	SEER	14	-	
	AIR PRESSURE DROP (IN WC)	0.35	-	
	OUTSIDE AIR TEMPERATURE DB (°F)	19.8	19.8	
	ENTERING AIR TEMPERATURE DB (°F)	55	19.8	
COIL	LEAVING AIR TEMPERATURE DB (°F)	124.7	113	
9	TOTAL CAPACITY (MBH)	65	160	
HEATING	FACE VELOCITY (FPM)	500	500	
出	AIR PRESSURE DROP (IN WC.)	0.35	0.10	
	HEAT TYPE	GAS HEAT	GAS HEAT	
	HEATING STAGES	2.0	16.0	
PRE	-FILTER - 2 INCH	MERV8	MERV8	
FINA	L FILTER - 4 INCH	MERV13	MERV13	
UNIT	LENGTH (IN)	61	161	
UNIT	WIDTH (IN)	37	52	
UNIT	HEIGHT (IN)	36	55	
UNIT	WEIGHT (LBS)	747	1909	
	VOLTAGE (V)	460	208	
CA	PHASE	3	3	
Ή	FREQUENCY (Hz)	60	60	
ELECTRICAL	MINIMUM CIRCUIT AMPS (A)	10.0	5.8	
ш	MAX FUXE SIZE (A)	15	15	
BASI	ED ON	TRANE	GREENHECK	
MOD	EL	PRECEDENT YSC036G	RV-10	
HEA	T PUMP REFRIGERANT	R410A	-	
REM	ARKS	1, 2, 3, 4, 5, 6 & 7	1, 2, 3, 4, 5, 6 & 7	
REM	ARKS LEGEND:			
I. PF	ROVIDE UNIT MOUNTED AND WIRED VFD FOR	REACH FAN MOTOR.		
2. PF	ROVIDE PREMIUM EFFICIENCY MOTORS RATE	ED FOR USE WITH VARIABLE FREC	UENCY DRIVE.	
3. PF	ROVIDE 120V CONVENIENCE OUTLET.			
4. EX	(TERNAL STATIC PRESSURES SHOWN DO NO	OT INCLUDE DIRTY FILTER LOSS.		
5. PF	ROVIDE BACKDRAFT DAMPERS FOR EACH FA	.N.		
	ONTROLLER INSTALLED AND WIRED IN THE F		 ₹.	

		UNIT HEA	ATER SCHEDU	ILE	
DESIGNATION		UH-8	UH-9	UH-10	UH-11
LOCATION		G101 WOMEN TOILET G102 MEN TOILET		G03 UNISEX TOILET	V016 ENTRY
AIRFLOW (CFM)		400	400	400	400
TYPE		ELECTRIC WALL MOUNT	ELECTRIC WALL MOUNT	ECTRIC WALL MOUNT ELECTRIC WALL MOUNT	
THROW		HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
MINIMUM CAPACITY (MBH)		2.1	15.5	4.9	2.1
ENTERING AIR TEMPERATURE (°F)		55.0	55.0	55.0	55.0
	POWER (W)	6	14	6	6
ECTRICAL	VOLTAGE (V)	208	208	208	208
T.Y.	PHASE	1	1	1	1
ELEC D	FREQUENCY (Hz)	60	60	60	60
	MAX APM RATING	15.9	24.1	15.9	15.9
MOTOR	HP	1/125	1/125	1/125	1/125
MO	RPM	1600	1600	1600	1600
REMARK	KS	1 & 2	1&2 1&2 1&2		1 & 2
REMARK	KS LEGEND:				
1. PROV	IDE WITH WALL MOUNTED THE	RMOSTAT.			
2. PROV	IDE INTEGRAL DISCONNECT.				

VEF-1
VEHICLE BAYS
CENTRIFUGAL BLOWER
PLYMOVENT

TEV-3110-60 3000 6.1

> DIRECT 460/3

(3) EXISTING HOSE DROPS

VEHICLE EXHAUST FAN SCHEDULE

DESIGNATION
AREA SERVED
FAN TYPE
MANUFACTURER
MODEL NUMBER
CAPACITY (CFM)
EXTERNAL STATIC PRESSURE (IN WC)
MOTOR POWER (HP)
MOTOR SPEED (RPM)
DRIVE

DRIVE ELECTRICAL VOLTAGE / PHASE

REMARKS:

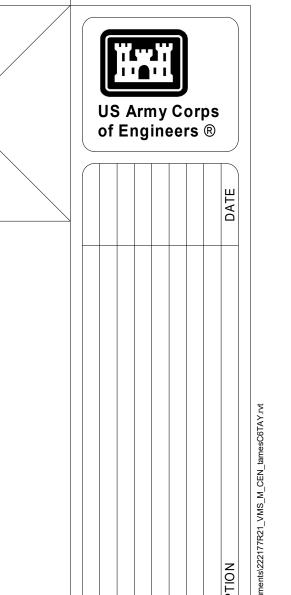
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INDOOR	UNIT DESIGNATION	NC	SS-4	SS-5	SS-6
OUTDOO	OR UNIT DESIGNA	TION	CU-4	CU-5	CU-6
ROOM S	ERVED		TR-103	ELECTRICAL-104	OFFICE-105
L		AIRFLOW (H/M/L)	304/221/167	304/221/167	304/221/167
LNU	EVAPORATOR	RATED TOTAL COOLING CAPACITY (MBH)	6	6	6
		RATED TOTAL HEATING CAPACITY (MBH)	8.7	8.7	8.7
INDOOR		VOLTAGE (V)	208	208	208
Š	ELECTRICAL	PHASE	1	1	1
=		FREQUENCY (Hz)	60	60	60
REFRIGI	REFRIGERANT			R-410A	R-410A
E	ELECTRICAL	AMBIENT DESIGN TEMPERATURE (°F)	95	95	95
LINO		MINIMUM CIRCUIT AMPACITY (A)	10	10	10
쏬		RECOMMENDED FUSE SIZE (A)	15	15	15
OUTDOOR		VOLTAGE (V)	208	208	208
片		PHASE	1	1	1
ರ		FREQUENCY (Hz)	60	60	60
REMARK	(S		1, 2, 3, & 4	1, 2, 3, & 4	1, 2, 3, & 4
REMARK	(S LEGEND:				
1. POWE	R FROM OUTDOO	OR UNIT, OUTDOOR UNIT POWER INCLUDES E CHARGE AS NEEDED FOR REFRIGERANT PIPE	VAPORATOR POWE	ER. INSTALL PER MANUI	ACTURER'S

AIR TERMINAL SCHEDULE								
TAG NUMBER S1 T1 T2 EG-1 EG-2								
DESCRIPTION	SUPPLY DIFFUSER	TRANSFER GRILLE	TRANSFER GRILLE	EXHAUST GRILLE	EXHAUST GRILLE	DRUM LOUVER		
TYPE	LAY-IN	LAY-IN	SIDE WALL	LAY-IN	SURFACE MOUNTED	DUCT MOUNTED		
	ROUND	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR		
NECK SIZE	A=6"							
NECK SIZE	B=8"	6"x6"	6"x6"	6"x6"	PER DRAWINGS	PER DRAWINGS		
	C=10"							
FRAME SIZE	24"x24"	24"x24"	8"x8"	24"x24"	PER DRAWINGS	PER DRAWINGS		
AIR PATTERN	4-WAY	4-WAY	PERFORATED	PERFORATED	PERFORATED	JET OUTLET		
MAX PRESSURE DROP (IN WC)	0.1	0.1	0.1	0.1	0.1	0.1		
MAX NC RATING	25	25	25	25	25	35		
MATERIAL	STEEL	STEEL	STEEL	STEEL	STEEL	ALUMINUM		
FINISH	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE		
REMARKS	1					1		
REMARK LEGEND:								
1. OPPOSED BLADE DAMPER								

4. PROVIDE CORROSION RESISTANT COATING ON CONDENSER COIL.

13



US ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
LOUISVILLE, KY
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G CENTER RENOVATION & ADDITION P2 #: 499678

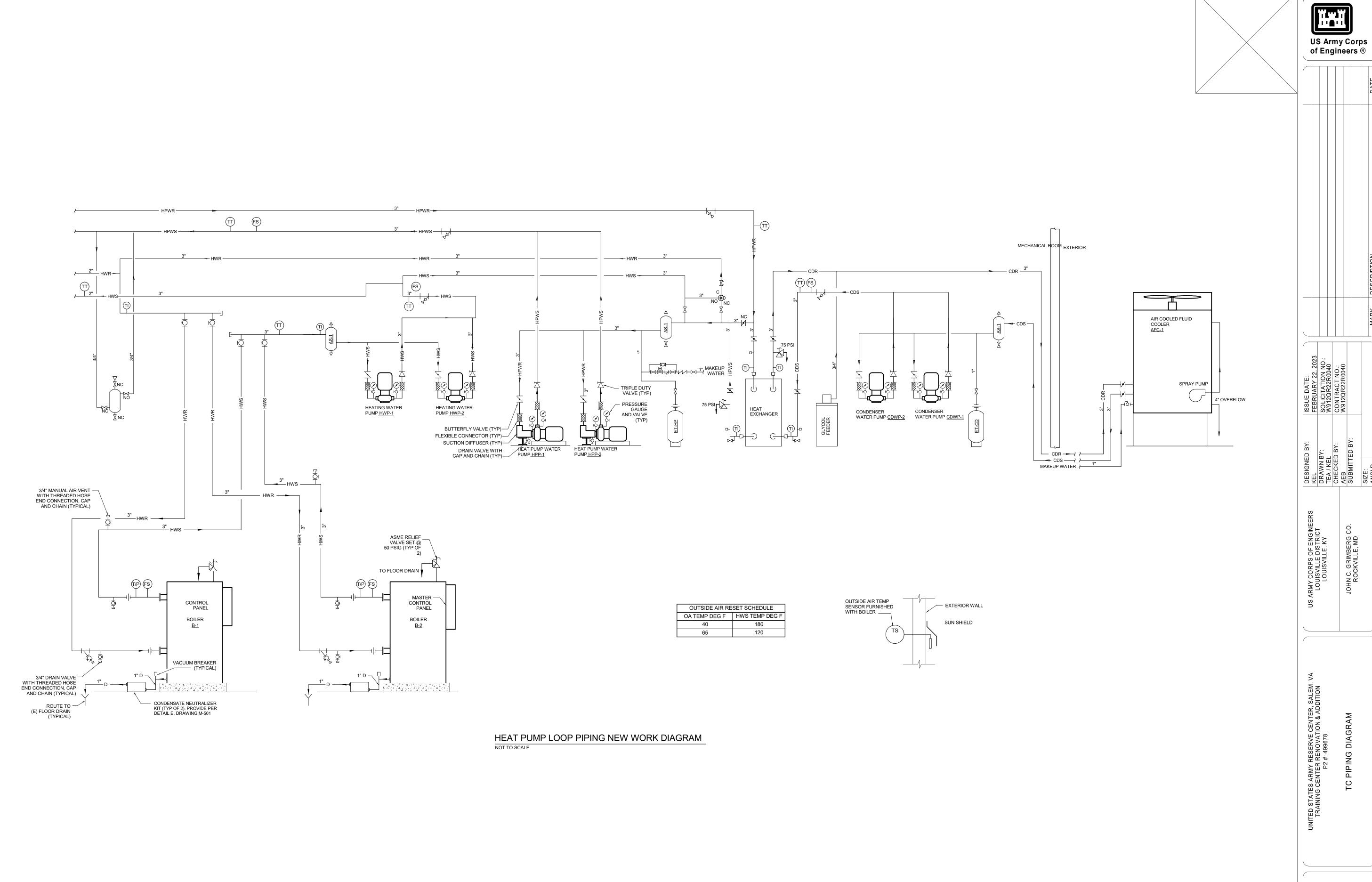
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